



GREEN WORK BOOK SOLUTIONS! Please revise!

EXAM DATES! Don't forget time 9am

Non calculator: Thursday May 25th

Calculator: Thursday June 8th

PAST PAPER SET A (June 2014)

2. Here are the times, in minutes, that 20 children took to walk to school.

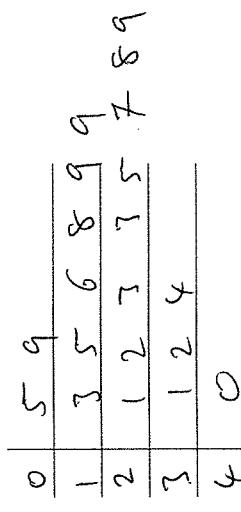
13	21	19	27	31	5	23	29	18	25
34	15	28	23	22	40	16	19	32	9

Draw an ordered stem and leaf diagram for these times.

1. (a) Work out $\frac{1}{7} \times \frac{2}{3} = \frac{1 \times 2}{7 \times 3} =$

$$\begin{array}{r} 2 \\ \hline 21 \end{array}$$

(b) Work out $\frac{3-1}{5-3} = \frac{2}{15} = -\frac{5}{15}$



(Total for Question 1 is 3 marks)

Key: $3 \mid 1 = 31$

(Total for Question 2 is 3 marks)

41

3. 50 people each did one activity at a sports centre.

Some of the people went swimming.
Some of the people played squash.
The rest of the people used the gym.

21 of the people were female.

6 of the 8 people who played squash were male.

18 of the people used the gym.

9 males went swimming.

Work out the number of females who used the gym.

	sw	SQ	GYM	TOT.
M	9	6	14	29
F	15	2	④	21
TOT.	24	8	18	50

4. Mr Brown and his 2 children are going to London by train.

An adult ticket costs £24.
A child ticket costs £12.

Mr Brown has a Family Railcard.

Family Railcard gives
$\frac{1}{3}$ off adult tickets
60% off child tickets

Work out the total cost of the tickets when Mr Brown uses his Family Railcard.

$$\begin{array}{r}
 10\% \text{ off } 12 \rightarrow 1.2 \\
 \hline
 50\% \\
 \hline
 60\%
 \end{array}$$

$$\begin{array}{r}
 24 = 8 \\
 \hline
 3
 \end{array}$$

$$24 - 8 = 16$$

$$\begin{array}{r}
 12 - 7.2 = 4.8 \\
 2 \times 4.8 = 9.6
 \end{array}$$

$$16 + 9.6 = 25.60$$

$$\text{£} \dots \underline{\hspace{2cm}} \dots$$

(Total for Question 4 is 4 marks)

64

.....
(Total for Question 3 is 4 marks)

JUNE 2014 (Non calculator)

42

JUNE 2014 (Non calculator)

42

5. Rebecca wants to find out how many books people buy.
She is going to use a questionnaire.

Design a suitable question for Rebecca to use in her questionnaire.

How many books do you buy in
a month?

$$0 \quad 1-3 \quad 4-6 \quad \text{more than } 6$$

- *7. The diagram shows the floor of a small field. OR $16 - 7 = 9\text{m}$

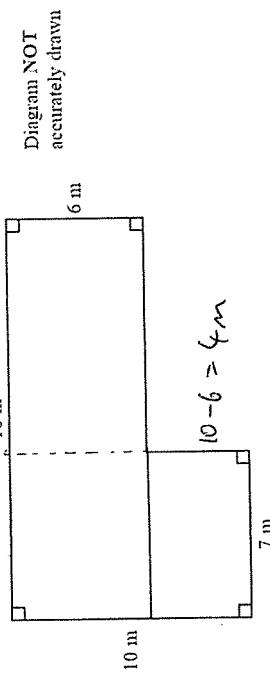


Diagram NOT
accurately drawn

Kevin is going to keep some pigs in the field.
Each pig needs an area of 36 square metres.

Work out the greatest number of pigs Kevin can keep in the field.

$$\begin{array}{r} 7 \times 4 = 28 \\ 16 \times 6 = 96 \\ \hline 124 \end{array}$$

6. (a) Expand $2m(m + 3)$

$$2m^2 + 6m$$

- (b) Factorise fully $3xy^2 - 6xy$

$$\begin{array}{r} 124 = 3 \cdot 4 \cdots \\ 36 \\ 108 \\ 144 \\ \hline 124 \end{array}$$

(Total for Question 5 is 2 marks)

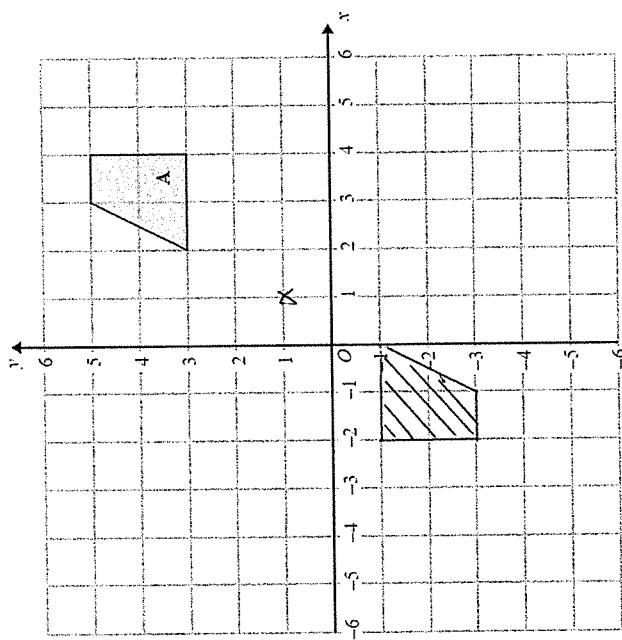
$$3xy(y - 2)$$

(2)
(Total for Question 6 is 3 marks)

200m for 3 pigs

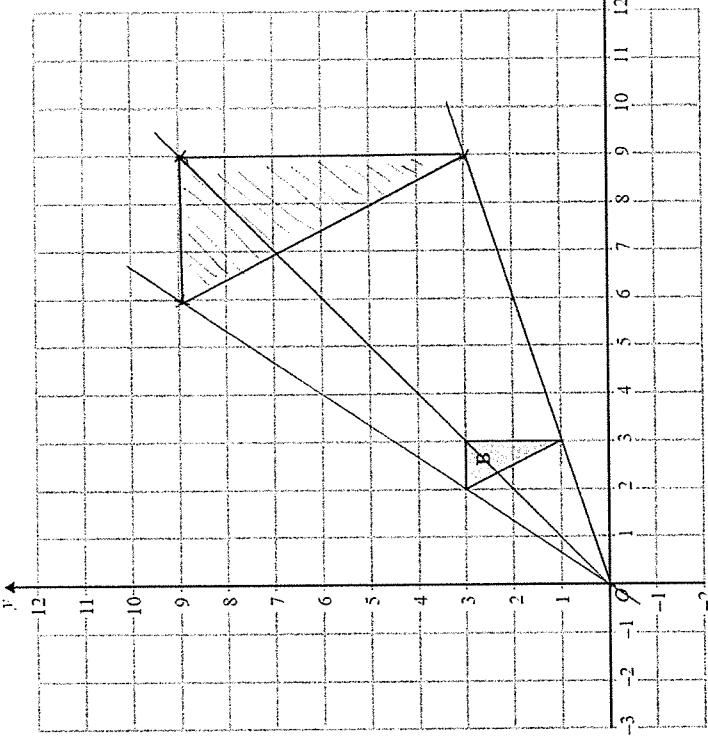
(Total for Question 7 is 4 marks)

9.



- (a) On the grid, rotate shape A 180° about the point $(1, 1)$.

(2)

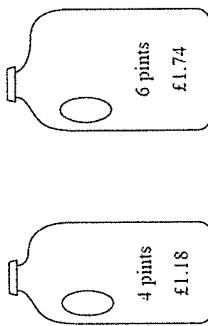


- (b) On the grid, enlarge triangle B by scale factor 3, centre $(0, 0)$.

(2)

(Total for Question 9 is 4 marks)

*10. Milk is sold in two sizes of bottle.



A 4 pint bottle of milk costs £1.18.
A 6 pint bottle of milk costs £1.74.

Which bottle of milk is the best value for money?
You must show all your working.

$$\frac{1.18}{4} = 0.295$$

$$\frac{1.74}{6} = 0.29$$

or compare 12 pints

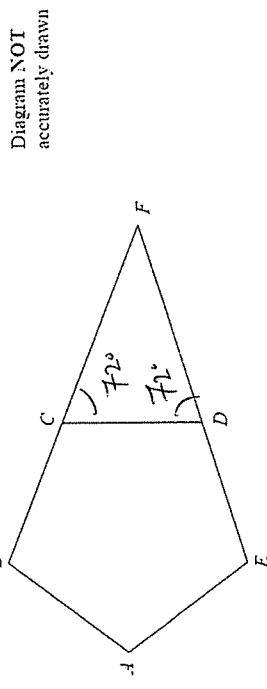
$$\begin{array}{r}
 1.18 \\
 1.18 \\
 1.18 \\
 \hline
 3.54
 \end{array}$$

$$\begin{array}{r}
 1.74 \\
 1.74 \\
 \hline
 3.48
 \end{array}$$

— — — 6 pint bottle is cheaper

(Total for Question 10 is 3 marks)

11.



ABCDE is a regular pentagon.
BCF and EDF are straight lines.

Work out the size of angle CFD.
You must show how you got your answer.

$$\text{external angle} = \frac{360}{5} = 72^\circ$$

Triangle adds up to 180°:

$$180 - 72 - 71 = 37^\circ$$

$$36$$

(Total for Question 11 is 3 marks)

12. You can change temperatures from °F to °C by using the formula

$$C = \frac{5(F - 32)}{9}$$

F is the temperature in °F.
 C is the temperature in °C.

The minimum temperature in an elderly person's home should be 20°C.
 Mrs Smith is an elderly person.

The temperature in Mrs Smith's home is 77°F.

*(a) Decide whether or not the temperature in Mrs Smith's home is lower than the minimum temperature should be.

$$\begin{aligned} C &= \frac{5(77 - 32)}{9} \\ &= 25 \quad \text{higher than minimum temperature} \end{aligned}$$

(3)

(b) Make F the subject of the formula $C = \frac{5(F - 32)}{9}$.

$$\begin{aligned} C &= \frac{5(F - 32)}{9} \\ 9C &= 5(F - 32) \\ \frac{9C}{5} &= F - 32 \\ \frac{9C}{5} + 32 &= F \end{aligned}$$

(Total for Question 12 is 6 marks)

*13.

Competition
a prize every 2014 seconds

In a competition, a prize is won every 2014 seconds.

Work out an estimate for the number of prizes won in 24 hours.
 You must show your working.

Seconds in 24 hrs :

$$24 \times 60 \times 60 = 86400$$

$$(25 \times 60 \times 60 = 90000)$$

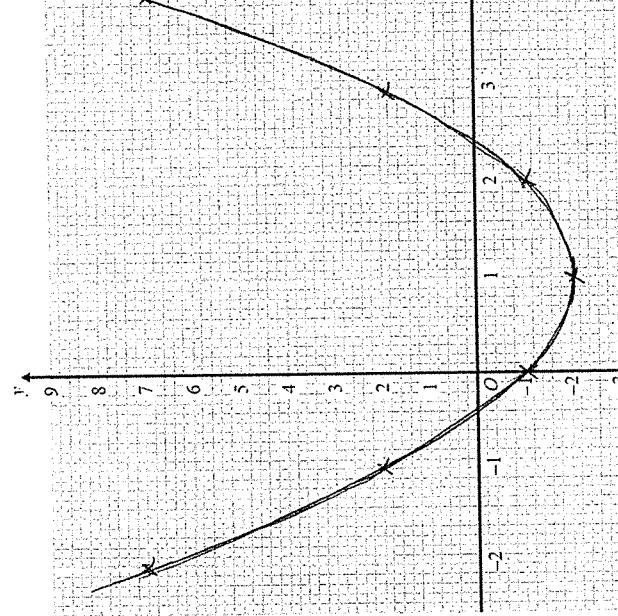
$$\begin{aligned} \frac{86400}{2000} &= 43 \quad \text{prizes} \\ &\text{about } 40 \end{aligned}$$

(Total for Question 13 is 4 marks)

15. (a) Complete the table of values for $y = x^2 - 2x - 1$.

x	-2	-1	0	1	2	3	4
y	7	2	-1	-2	-1	2	7

(b) On the grid, draw the graph of $y = x^2 - 2x - 1$ for values of x from -2 to 4.



(Total for Question 15 is 4 marks)

16. Colin took a sample of 80 football players.

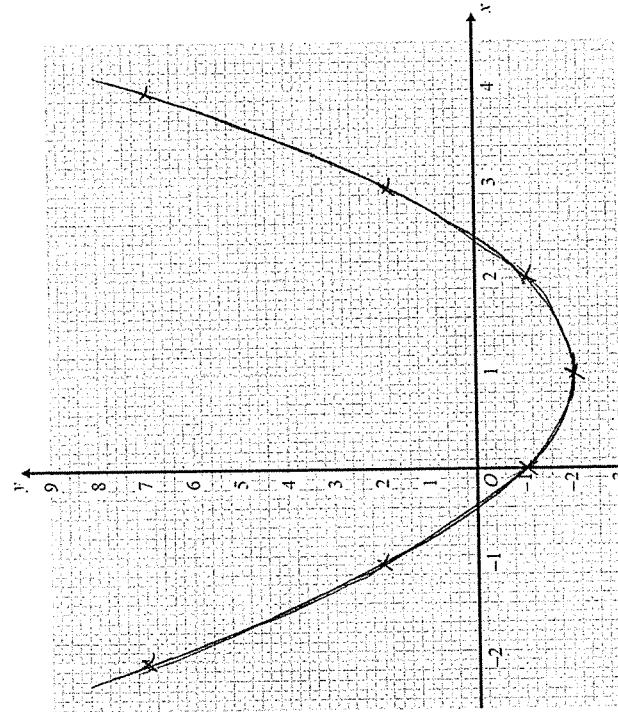
He recorded the total distance, in kilometres, each player ran in the first half of their matches on Saturday.

Colin drew this box plot for his results.



(2)

(b) On the grid, draw the graph of $y = x^2 - 2x - 1$ for values of x from -2 to 4.



(Total for Question 15 is 4 marks)

$$\text{e.g. } y = x^2 - 2x - 1 \\ \text{when } x = 3 : y = (3)^2 - 2(3) - 1 \\ = 9 - 6 - 1 \\ = 2$$

JUNE 2014 (Non calculator)

16. Colin took a sample of 80 football players. He recorded the total distance, in kilometres, each player ran in the first half of their matches on Saturday.

Colin drew this box plot for his results.



(2)

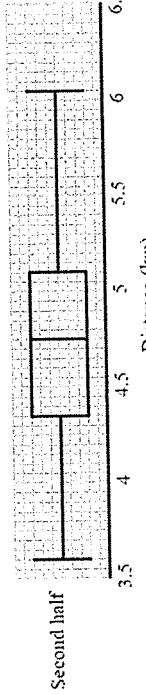
There were 80 players in Colin's sample.

(b) Work out the interquartile range.

$$80 \times \frac{1}{4} = 20 \quad (2)$$

Colin also recorded the total distance each player ran in the second half of their matches.

He drew the box plot below for this information.



- (c) Compare the distribution of the distances run in the first half with the distribution of the distances run in the second half.

Median distance run in first half is 5.0 km compared to 4.7 km in 2nd half.
Smallest distance run in first half is 3.6 km compared to 3.7 km in 2nd half.

(Total for Question 16 is 6 marks)

JUNE 2014 (Non calculator)

JUNE 2014 (Non calculator)

17. (a) Write down the value of 10^0 .

$$\boxed{1}$$

- (c) Write these numbers in order of size.

Start with the smallest number.

$$2.73 \times 10^3$$

$$273 \times 10^2$$

$$0.00273$$

$$2730$$

$$273$$

$$27.3$$

$$0.00273, 27.3, 273, 273 \times 10^2, 273 \times 10^3, 2730$$

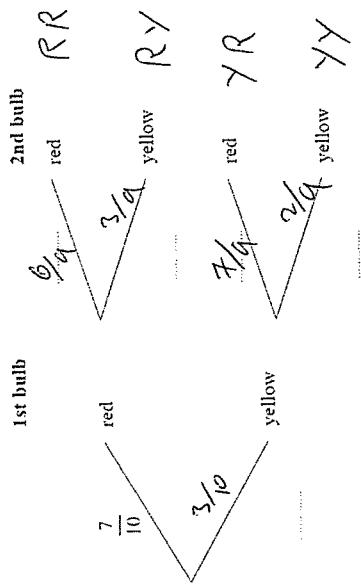
(Total for Question 17 is 4 marks)

23. Yvonne has 10 tulip bulbs in a bag.

7 of the tulip bulbs will grow into red tulips.
3 of the tulip bulbs will grow into yellow tulips.

Yvonne takes at random two tulip bulbs from the bag.
She plants the bulbs.

- (a) Complete the probability tree diagram.



- (b) Work out the probability that at least one of the bulbs will grow into a yellow tulip.

$$RY : \frac{7}{10} \times \frac{3}{9} = \frac{21}{90}$$

$$YR : \frac{3}{10} \times \frac{7}{9} = \frac{21}{90}$$

$$YY : \frac{3}{10} \times \frac{2}{9} = \frac{6}{90}$$

$$21 + 21 + 6 = 48$$

$$\frac{48}{90} = \frac{8}{15}$$

(Total for Question 23 is 5 marks)

PAST PAPER SET A

25. (a) Rationalise the denominator of $\frac{12}{\sqrt{3}}$

$$\frac{12}{\sqrt{3}} = \frac{12}{\cancel{\sqrt{3}}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{12}{3} \sqrt{3} = 4\sqrt{3}$$

Find the coordinates of M .

$$4\sqrt{3}$$

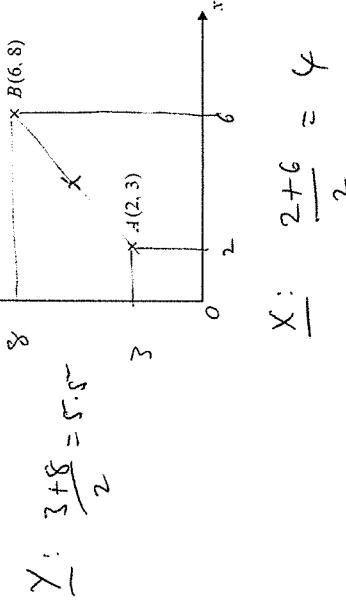
(2)
(Total for Question 25 is 2 marks)

1. The point A has coordinates $(2, 3)$.
The point B has coordinates $(6, 8)$.

M is the midpoint of the line AB .

Find the coordinates of M .

Diagram NOT
accurately drawn



$$X : \frac{2+6}{2} = 4$$

$$(4, 5.5)$$

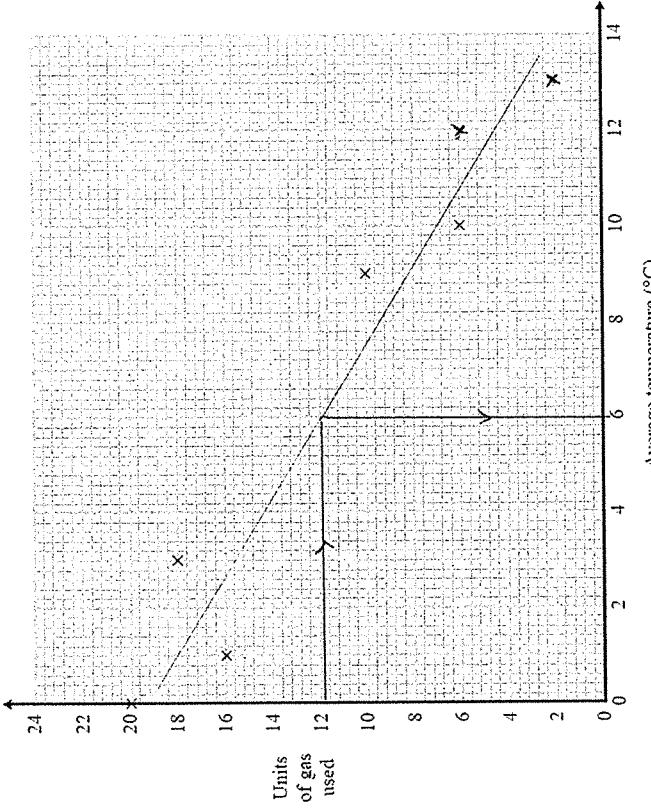
(Total for Question 1 is 2 marks)

2. The table shows the average temperature on each of seven days and the number of units of gas used to heat a house on those days.

Average temperature (°C)	0	1	3	9	10	12	13
Units of gas used	20	16	18	10	6	6	2

- (c) Estimate the average temperature on a day when 12 units of gas are used.

From graph:
6..... °C
(2)



- (a) Complete the scatter graph to show the information in the table.
The first 5 points have been plotted for you.

- (1)
(b) Describe the relationship between the average temperature and the number of units of gas used.
As the temperature increases, the number of units of gas decreases.

(Total for Question 2 is 4 marks)

3. $x = 0.7$

Work out the value of $\frac{(x+1)^2}{2x}$.

Write down all the figures on your calculator display.

$$\frac{(0.7 + 1)^2}{2 \times 0.7} = 2.064285714$$

(Total for Question 3 is 2 marks)

4. Here is a circle.

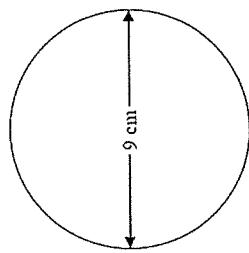


Diagram NOT
accurately drawn

The diameter of the circle is 9 cm.

Work out the circumference of this circle.

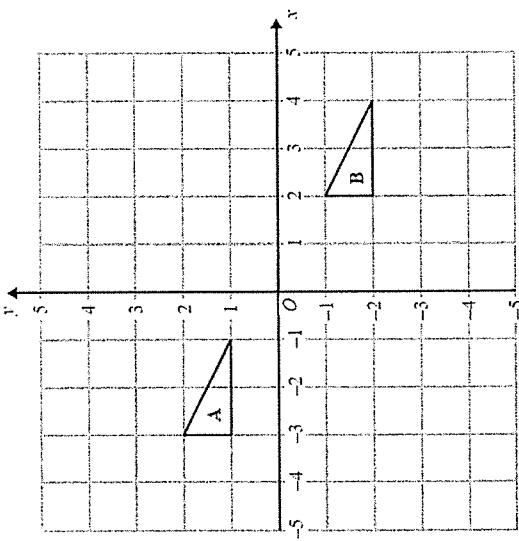
Give your answer correct to 3 significant figures.

$$\begin{aligned}
 C &= \pi D \\
 &\approx 3.14159 \dots \times 9 \\
 &\approx 28.274 \dots
 \end{aligned}$$

28.2 cm

(Total for Question 4 is 2 marks)

- 5.



Describe the single transformation that maps triangle A onto triangle B.

Triangle A is mapped onto triangle B by a reflection in the line $x = -1$.

(Total for Question 5 is 2 marks)

6. Sue is driving home from her friend's house.

Sue drives

10 miles from her friend's house to the motorway
240 miles on the motorway
5 miles from the motorway to her home

Sue

takes 20 minutes to drive from her friend's house to the motorway
drives at an average speed of 60 mph on the motorway
takes 25 minutes to drive from the motorway to her home

Sue stops for a 30 minute rest on her drive home.

Sue leaves her friend's house at 9.00 am.

What time does Sue get home?

You must show all your working.

$$\frac{240}{60} = 4 \text{ hrs on motorway}$$

$$\begin{array}{r} 20 \text{ min to motorway} \\ 25 \text{ min " home} \\ 30 \text{ min rest} \\ \hline 75 \text{ min} \rightarrow 1 \text{ hr } 15 \text{ min} \end{array}$$

$$6 \text{ ad } 4 + 1 \text{ hr } 15 \text{ min}$$

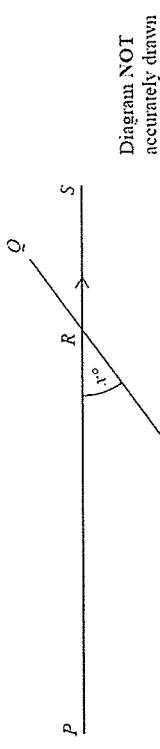
$$5 \text{ hrs } 15 \text{ mins}$$

$$\text{leaves at } 9.00 + 5 \text{ hrs } 15 \text{ mins}$$

$$14.15 \text{ or } 2.15 \text{ pm}$$

.....
(Total for Question 6 is 3 marks)

*7.



PRS and TY are parallel straight lines.
 $QRHZ$ is a straight line.

Work out the value of x .
Give reasons for your answer.

$$180 - 126 = 54^\circ$$

angle in straight line add to 180°
alternate angle

(Total for Question 7 is 3 marks)

8. Lorna carries out a survey about the number of times customers go to a shop.
She asks at random 100 customers how many times they went to the shop last month.

The table shows Lorna's results.

Number of times	0	1	2	3	4	5	6	more than 6
Frequency	4	12	13	17	25	13	11	5

One of the 100 customers is chosen at random.

- (a) What is the probability that this customer went to the shop 5 or more times?

$$13 + 11 + 5 = 29$$

$$\frac{29}{100}$$
(2)

Last month the shop had a total of 1500 customers.

- (b) Work out an estimate for the number of customers who went to the shop exactly 2 times last month.

$$\frac{13}{100} \times 1500 = 195$$
(2)

The owner of a different shop is carrying out a survey on the ages of his customers.
He records the ages of the first 10 customers in his shop after 9 am one morning.

- (c) This may not be a suitable sample.

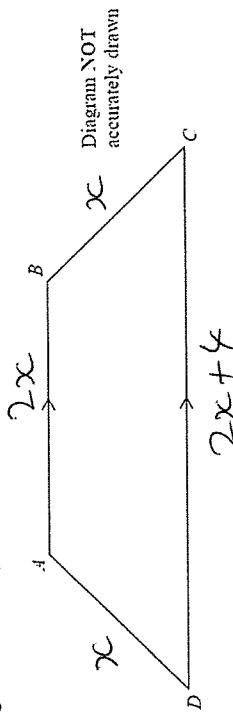
Give two reasons why.

1. Too small sample

2. True representative of all
customers

(Total for Question 8 is 6 marks)

9. The diagram shows a trapezium.



$$AD = x \text{ cm}$$

BC is the same length as AD.

AB is twice the length of AD.

DC is 4 cm longer than AB.

The perimeter of the trapezium is 38 cm.

Work out the length of AD.

$$2x + 2x + x + 2x + 4 = 38$$

$$6x + 4 = 38$$

$$6x = 34$$

$$x = 6 \frac{2}{3}$$

(Total for Question 9 is 4 marks)

10. (a) Simplify $(\varphi^3)^2$

$$(b) \text{ Simplify } \frac{x^8}{x^3}$$

$$2^3 \times 2^n = 2^9$$

- (c) Work out the value of n .

$$\begin{aligned} 3 + n &= 9 \\ n &= 6 \end{aligned}$$

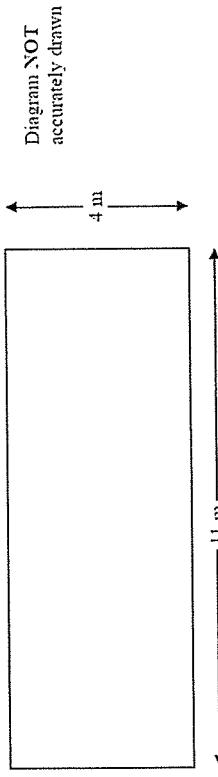
$$2x^3 = 128$$

- (d) Work out the value of x .

$$\begin{aligned} 2x^3 &= 128 \\ x^3 &= \frac{128}{2} = 64 \\ x &= \sqrt[3]{64} = 4 \end{aligned}$$

(Total for Question 10 is 4 marks)

11. Here is a plan of Martin's driveway.



Martin is going to cover his driveway with gravel.
The gravel will be 6 cm deep.

Gravel is sold in bags.
There are 0.4 m³ of gravel in each bag.
Each bag of gravel costs £38.

Martin gets a discount of 30% off the cost of the gravel.

Work out the total amount of money Martin pays for the gravel.

$$\begin{aligned} \text{Volume} &= 11 \times 4 \times 0.06 \\ &= 2.64 \text{ m}^3 \\ \frac{2.64}{0.4} &= 6.6 \text{ , so } 7 \text{ bags} \end{aligned}$$

$$\begin{aligned} 7 \times 38 &= 266 \\ 30\% \text{ off} &\text{ is } 70\% \text{ (0.7)} \end{aligned}$$

$$266 \times 0.7 = 186.2$$

Or calculate 30% and
Subtract

£ 186.20

(Total for Question 11 is 5 marks)

12. Here are the first five terms of an arithmetic sequence.

4	9	14	19	24
\nearrow	\nearrow	\nearrow	\nearrow	\nearrow
$\overbrace{\hspace{10em}}$				

(a) Find, in terms of n , an expression for the n th term of this sequence.

13. $-5 < y \leq 0$

y is an integer.

(a) Write down all the possible values of y .

(a) Find, in terms of n , an expression for the n th term of this sequence.

4 9 14 19 24

卷之三

13. $-5 < y \leq 0$

y is an integer.

(a) Write down all the possible values of y .

4 9 14 19 24

12. Here are the first five terms of an arithmetic sequence.

y is an integer.

(a) Write down all the possible values of y .

4 9 14 19 24

(a) Find, in terms of n , an expression for the n th term of this sequence.

Here are the first five terms of a different sequence.

2 2 0 -4 -10

An expression for the n th term of this sequence is $3n - n^2$.

(b) Write down, in terms of n , an expression for the n th term of a sequence whose first five terms are

$$4 \quad 4 \quad 0 \quad -8 \quad -20$$

double values

$$2(3n-n^2)$$

(1)

(Total for Question 13 is 4 marks)

卷之三

JUNE 2014 (Calculator)

14. Ali is planning a party.

He wants to buy some cakes and some sausage rolls.

The cakes are sold in boxes.
There are 12 cakes in each box.
Each box of cakes costs £2.50.

The sausage rolls are sold in packs.
There are 8 sausage rolls in each pack.
Each pack of sausage rolls costs £1.20.

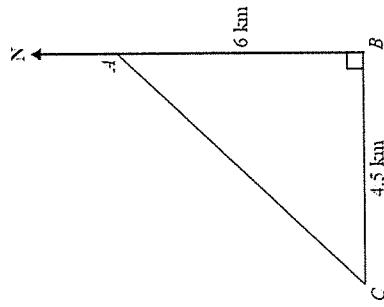
Ali wants to buy more than 60 cakes and more than 60 sausage rolls.
He wants to buy exactly the same number of cakes as sausage rolls.

What is the least amount of money Ali will have to pay?

Cakes	S. rolls
12	8
24	16
36	24
48	32
60	40
72	48
	56
	64
	72

15. The diagram shows the positions of three turbines A, B and C.

Diagram NOT
accurately drawn



A is 6 km due north of turbine B.
C is 4.5 km due west of turbine B.

(a) Calculate the distance AC.

$$4.5^2 + 6^2 = AC^2$$

$$\sqrt{6.25} = AC$$

$$AC = \sqrt{6.25} = \sqrt{25} = 5$$

(Total for Question 15 is 3 marks)

$$6 \times \$2.50 + 10.8 = 25.80$$

$$25.80$$

(Total for Question 14 is 5 marks)

16. Work out the value of $(7.5 \times 10^4) \times (2.5 \times 10^3)$.
Give your answer in standard form.

$$7.5 \times 2.5 \times 10^4 \times 10^3 \\ 18.75 \times 10^7$$

$$1.875 \times 10^8$$

(Total for Question 16 is 2 marks)

17.

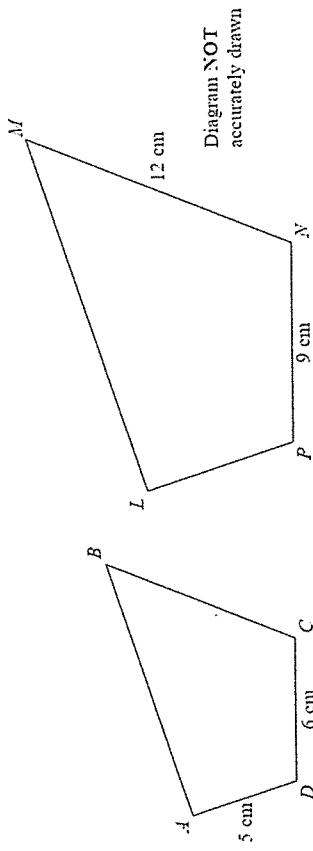


Diagram NOT
accurately drawn

Quadrilaterals $ABCD$ and $LMNP$ are mathematically similar.

Angle A = angle L
Angle B = angle M
Angle C = angle N
Angle D = angle P

(a) Work out the length of LP .

$$\frac{DC}{BC} = \frac{PN}{NP} \\ 6 \rightarrow 9$$

$$\frac{5}{6} = \frac{7.5}{x} \\ 5x = 7.5 \times 6 \\ 5x = 45 \\ x = 9$$

(b) Work out the length of BC .

$$\frac{12}{7.5} = \frac{8}{x} \\ 12x = 7.5 \times 8 \\ 12x = 60 \\ x = 5$$

..... cm (2)
(Total for Question 17 is 4 marks)

21. (a) Expand and simplify $(y-2)(y-5)$

$$(y-2)(y-5)$$

$$y^2 - 5y - 2y + 10$$

$$\dots \dots \dots \dots \quad (2)$$

(Total for Question 21 is 2 marks)

23. The table shows information about the ages of the people living in a village.

Age group	Number of people
Under 21	72
21-40	90
41-60	123
Over 60	314

Mrs Parrish carries out a survey of these people.
She uses a sample size of 50 people stratified by age group.

- (b) Work out the number of people over 60 years of age in the sample.

$$\frac{314}{599} \times 50 = 26.2$$

$$26 \dots \dots \dots \dots \quad (2)$$

(Total for Question 23 is 2 marks)

PAST PAPER SET B (Nov 2014)

1. Using the information that

$$6.7 \times 52 = 348.4$$

find the value of

(i) $6.7 \times 520 \rightarrow 7 \times 500 = 3500$
34.84 is very close to 3500 ①

(ii) $67 \times 0.52 \rightarrow 70 \times 0.5 = 35$
34.84 is very close to 35 ②

(iii) $3484 \div 52 \rightarrow 3500 \div 5 = 700$
670 is closer to 700 ③

(Total for Question 1 is 3 marks)

- *2. Karen got 32 out of 80 in a maths test.
 She got 38% in an English test.

Karen wants to know if she got a higher percentage in maths or in English.

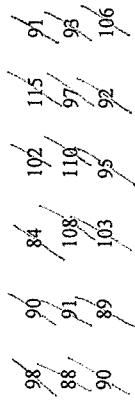
Did Karen get a higher percentage in maths or in English?

$$\frac{32}{80} = \frac{4}{10} = \frac{40}{100} = 40\% \text{ (1)}$$

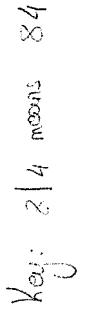
\Rightarrow Karen got a higher percentage in Maths since 40% is greater than 38% (1)

(Total for Question 2 is 2 marks)

3. Here are the heights, in cm, of 18 children.

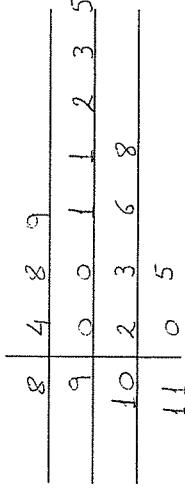


Show this information in an ordered stem and leaf diagram.



(1) two rows correct

(2) for off rows correct.



(Total for Question 3 is 3 marks)

4. Kalinda buys x packs of currant buns and y boxes of iced buns.

- There are 6 currant buns in a pack of currant buns.
- There are 8 iced buns in a box of iced buns.

Kalinda buys a total of T buns.

85
+
62
—

Write down a formula for T in terms of x and y .

(Total for Question 4 is 3 marks)

(b) Here is an inequality, in x , shown on a number line.



Write down the inequality.

$$-3 < x \leq 4 \quad \text{① (including } \leq \text{ sign)}$$

(Total for Question 5 is 4 marks)

- *6. Steve wants to put a hedge along one side of his garden.
He needs to buy 27 plants for the hedge.
Each plant costs £5.54.

He needs to buy 27 plants for the hedge.
Each plant costs £5.54.

Steve has £150 to spend on plants for the hedge.

Does Steve have enough money to buy all the plants he needs?

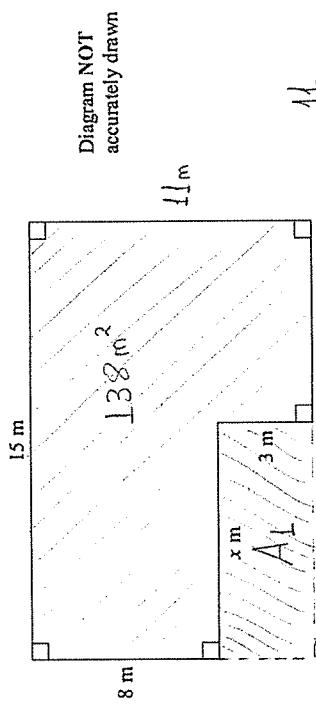
$$\begin{array}{rcl}
 5.54 \times 27 = 149.58 & \Rightarrow & \text{Steve has enough money} \\
 & & \text{to spend for the hedge since } \not\approx 15 \\
 & & \text{one more than } 149.58 \text{ by } 42p \\
 \hline
 \begin{array}{r|rrr}
 & 500 & 50 & 4 \\ \hline
 \times & 500 & 50 & 4 \\ \hline
 & 1000 & 100 & 20 \\ \hline
 & 3500 & 350 & 28 \\ \hline
 & 3500 & 350 & 28 \\ \hline
 & 150 - 149.58 = 42p & & \end{array} & & \text{①}
 \end{array}$$

(Total for Question 6 is 4 marks)



- NEDERLANDS Tijdschrift voor Psychologie

7. The diagram shows the plan of a floor.



The area of the floor is 138 m^2 .

Work out the value of x .

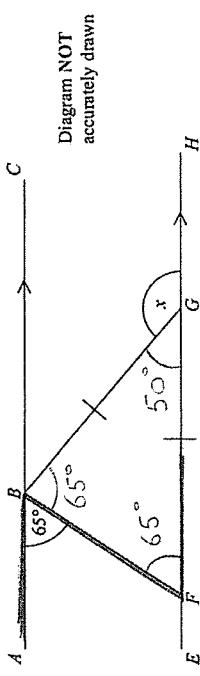
$$11 \times 15 = 165 \text{ m}^2 \quad \textcircled{1}$$

$$\begin{aligned} A_1 &= 165 - 138 \\ &= 27 \quad \textcircled{1} \end{aligned}$$

$$3 \times x = 27 \quad \textcircled{1}$$

$$x = 9 \text{ m} \quad \textcircled{1}$$

- *8.



ABC is parallel to $EFGH$.

$$GB = GF$$

$$\text{Angle } ABE = 65^\circ$$

Work out the size of the angle marked x .
Give reasons for your answer.

- Angle $BFG = 65^\circ$ - Alternate angles are equal $\textcircled{1}$
- Triangle BFG is an isosceles triangle since $BG = FG$ $\textcircled{1}$
- Base angles of an isosceles triangle are equal

$$\Rightarrow \angle FGC = \angle FGB$$

$$65 + 65 = 130^\circ \quad \textcircled{1}$$

$180 - 130 = 50^\circ$ - angles in a triangle add up to 180°

- $180 - 50 = 130^\circ$ - angles on a straight line add up to 180° $\textcircled{1}$

(Total for Question 7 is 4 marks)

(Total for Question 8 is 4 marks)

9. Jack wants to find out how far people live from their nearest supermarket.
He uses this question on a questionnaire.

How far do you live from your nearest supermarket?				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 to 2	2 to 3	3 to 4	4 to 5	5 to 6

(a) Write down two things wrong with this question.

1. Question does not specify the unit of distance from the supermarket. i.e. metres, km, miles..... (1)
2. There is a gap in the choices available.....
i.e. 0 to 2, 2 to 3, 3 to 4, (1)

Jack also wants to find out how often people go shopping,

(b) Write a question Jack could use on his questionnaire to find out how often people go shopping.

How often do you go shopping per week? (1)

- 0 to 2 times 3 to 5 times 5 or more

(1)

(Total for Question 9 is 4 marks) (2)

11. Ria is going to buy a caravan.
The total cost of the caravan is £7000 plus VAT at 20%.

Ria pays a deposit of £3000.

She pays the rest of the total cost in 6 equal monthly payments.

Work out the amount of each monthly payment.

$\frac{20\% \text{ of } 7000}{ }$

$$\begin{aligned} &\cancel{20\%} \cancel{\left(\frac{10\% \text{ of } 7000 = 700}{\cancel{10\%} \cancel{\left(\frac{10\% \text{ of } 7000 = 700}{\times 2}\right)}}\right)} \\ &7000 + 1400 = 8400 \quad \text{①} \\ &8400 - 3000 = 5400 \quad \text{②} \\ &5400 \div 6 = 900 \quad \text{③} \end{aligned}$$

£..... 900.....

(Total for Question 11 is 4 marks)

12. (a) Factorise $3e^2 + 5e$

$$\textcircled{1} e(3e+5)$$

(b) Solve $7(k-3) = 3k - 5$

$$7(k-3) = 3k - 5 \quad \text{.....} \textcircled{1}$$

$$7k - 21 = 3k - 5$$

$$7k - 3k - 21 = -5$$

$$4k - 21 = -5 \quad \text{.....} \textcircled{1}$$

$$4k = -5 + 21$$

(c) Expand and simplify $(2x+3)(x-8)$

$$\begin{array}{r} 2x \mid 3 \\ \cancel{x} \cancel{2x^2} \cancel{3x} \\ -8 \end{array} \quad 2x^2 - 16x + 3x - 24 \quad \text{.....} \textcircled{1}$$

$$2x^2 - 13x - 24 \quad \text{.....} \textcircled{2}$$

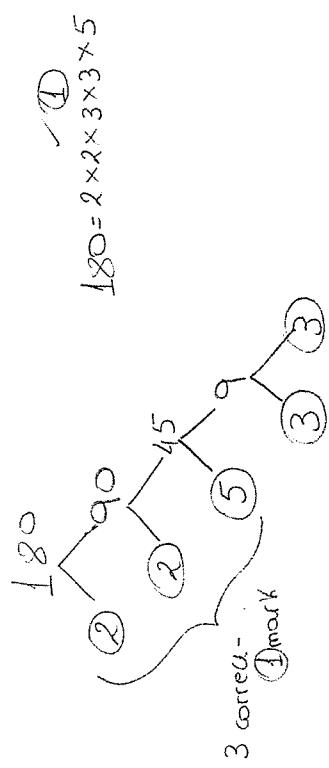
(d) Solve $\frac{7-3f}{4} = 2$

$$\frac{7-3f}{4} = 2 \rightarrow \boxed{7-3f} \rightarrow \boxed{+7} \rightarrow \boxed{\div 4} \rightarrow \boxed{2} \quad \text{.....} \textcircled{1}$$

$$\begin{array}{r} f = -\frac{1}{3} \rightarrow \boxed{-3} \rightarrow \boxed{\div 4} \rightarrow \boxed{2} \rightarrow \boxed{\times 4} \rightarrow f = -\frac{1}{3} \\ \hline f = -\frac{1}{3} \end{array} \quad \text{.....} \textcircled{2}$$

(Total for Question 12 is 9 marks)

13. (a) Express 180 as a product of its prime factors.



$$180 = 2 \times 2 \times 3 \times 3 \times 5 \quad \checkmark \textcircled{1}$$

(Total for Question 13 is 3 marks)

14. Suha has a full 600 ml bottle of wallpaper remover.
She is going to mix some of the wallpaper remover with water.

Here is the information on the label of the bottle.

Wallpaper remover	600 ml
Mix $\frac{1}{4}$ of the wallpaper remover with 4500 ml of water	

Suha is going to use 750 ml of water.

How many millilitres of wallpaper remover should Suha use?
You must show your working.

$$\frac{1}{4} \text{ of } 600 = \frac{1}{4} \times 600 = 150 \text{ ml}$$

$$\begin{aligned} \text{remover} &\xrightarrow{\text{water}} 150 \rightarrow 4500 \\ ?(15) &\rightarrow 4500 \quad (1) \\ ?(15) &\rightarrow 750 \quad (1) \\ 5 \times 5 &= 25 \quad (1) \\ 30 & \end{aligned}$$

25 ml.....ml

(Total for Question 14 is 4 marks)

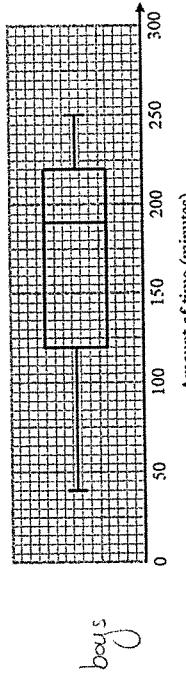
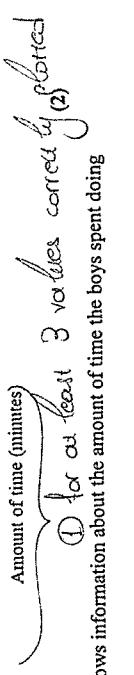
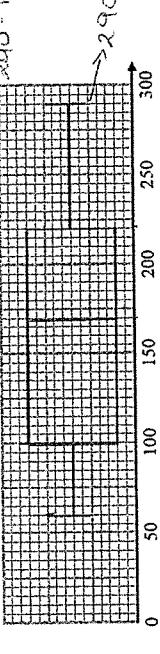
15. The students in a class kept a record of the amount of time, in minutes, they spent doing homework last week.

The table shows information about the amount of time the girls spent doing homework last week.

	Minutes
Least amount of time	60
Range	230
Median	170
Lower quartile	100
Upper quartile	220

$$\begin{aligned} \text{Range} &= \text{highest - lowest} \\ 230 &= \text{highest} - 60 \\ 230 &= \text{highest} \quad (1) \end{aligned}$$

(a) On the grid, draw a box plot for the information in the table.



The box plot below shows information about the amount of time the boys spent doing homework last week.

- *(b) Compare the amount of time the girls spent doing homework with the amount of time the boys spent doing homework.
- The median for girls is higher than the median for boys.
- The range for boys is higher than the range for girls.
- (1)
- (2)

16. There are 200 workers at a factory.

The cumulative frequency table gives information about their ages.

Age (a years)	Cumulative frequency
$0 < a \leq 20$	25
$0 < a \leq 30$	70
$0 < a \leq 40$	138
$0 < a \leq 50$	175
$0 < a \leq 60$	186
$0 < a \leq 70$	194
$0 < a \leq 80$	200

- (a) On the grid opposite, draw a cumulative frequency graph for this information.

(2)

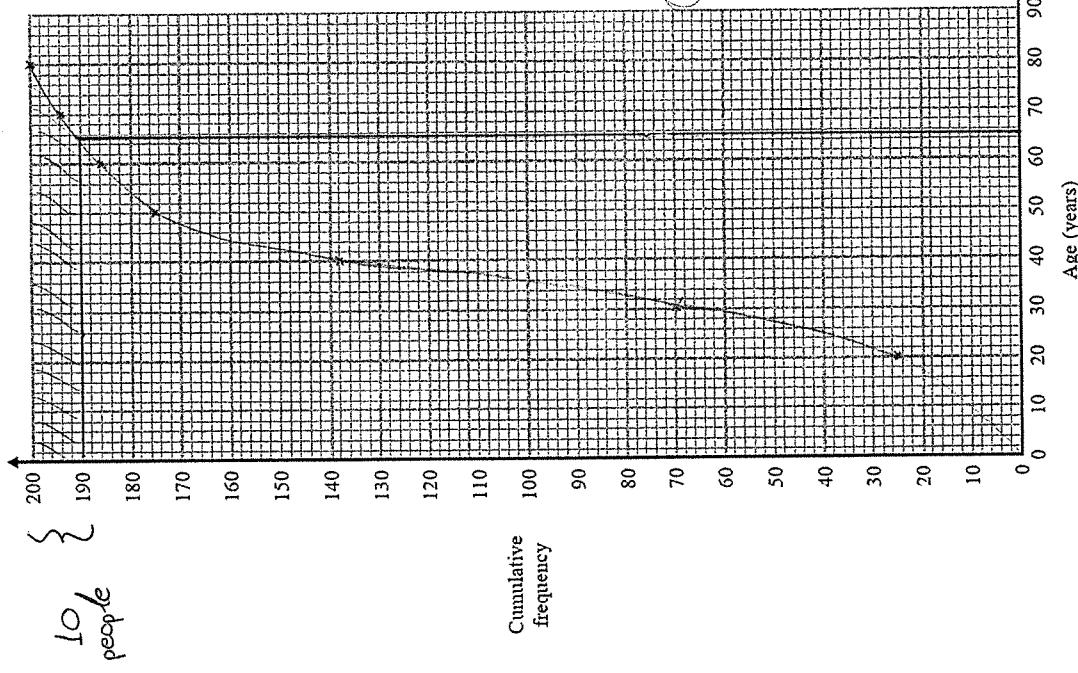
- (b) Graham says,

"10% of workers at the factory are older than 65"

Is Graham correct?

You must show how you get your answer.

From the cumulative frequency graph: ① 10 people in total
are above 65 years old
 $\frac{10}{200} = \frac{1}{20} = 5\%$ ②
∴ Graham is wrong since 10 out of 200 workers is 5% NOT 10%



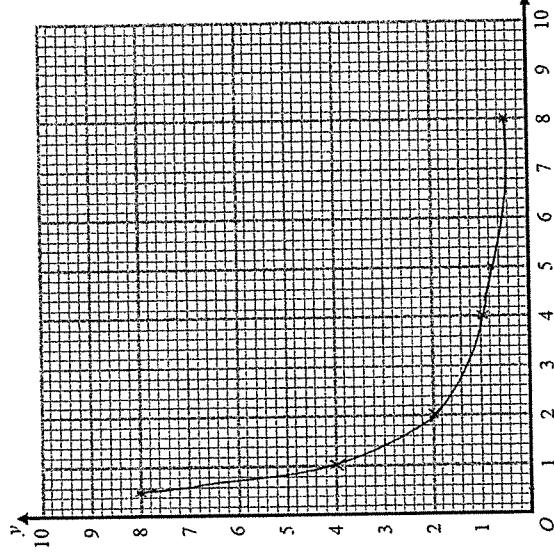
(Total for Question 16 is 4 marks)

PAST PAPER SET B (Nov 2014)

19. (a) Complete the table of values for $y = \frac{4}{x}$

x	0.5	1	2	4	5	8
y	8	4	2	1	0.8	0.5

- (b) On the grid, draw the graph of $y = \frac{4}{x}$ for $0.5 \leq x \leq 8$
- ~~2 correct - ① mark~~
~~or ② mark~~



1. Here are the ingredients needed to make 10 pancakes.

Pancakes	
Ingredients to make 10 pancakes	
300 ml	of milk
120 g	of flour
2	eggs

2 correct - ① mark

or ② mark

Matthew makes 30 pancakes.

- (a) Work out how much flour he uses.

$$\begin{aligned} & \frac{\text{Pancakes}}{10} \rightarrow \cancel{10} \text{ for } \cancel{10} \\ & \times 3 \left(\frac{10}{30} \rightarrow 100 \right) \cancel{2} \times 3 \sqrt{10} \\ & \textcircled{1} \quad \rightarrow 360 \end{aligned}$$

..... 360 g (2)

Tara makes some pancakes.
She uses 750 ml of milk.

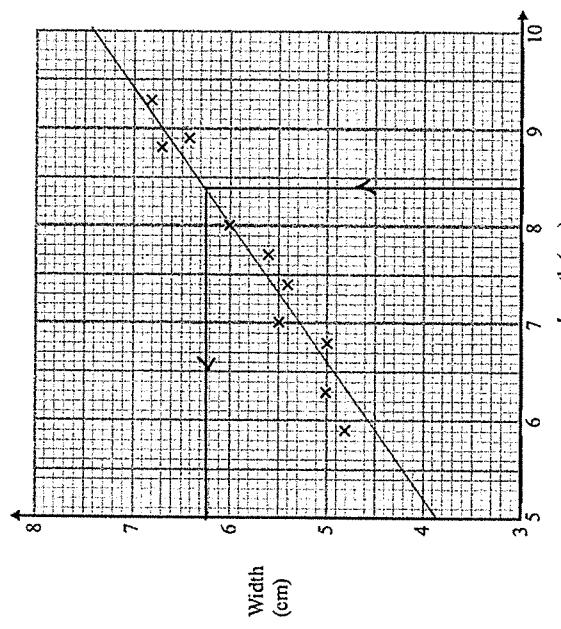
- (b) Work out how many pancakes she makes.

$$\begin{aligned} & \frac{\text{Pancakes}}{10} \rightarrow \cancel{10} \text{ for } \cancel{10} \\ & \times 2.5 \left(\frac{10}{?} \rightarrow 300 \right) \cancel{2.5} \\ & \textcircled{1} \quad \rightarrow 750 \end{aligned}$$

..... 1 (2)
(Total for Question 19 is 4 marks)

22. (a) Simplify fully $(3e)^0$ 1 (1)
..... 1 (2)
(Total for Question 22 is 1 mark)

2. The scatter graph shows some information about ten pine cones from the same tree.
It shows the length and the width of each pine cone.



3. $f = 3g + 7h$

(a) Work out the value of f when $g = -5$ and $h = 2$

$$\begin{aligned} f &= 3(\overset{x}{-5}) + 7(\overset{x}{2}) \quad (1) \\ &= -15 + 14 \\ (b) \text{ Factorise } &= \frac{1}{3x+6} \end{aligned}$$

$$3(\overset{x}{\chi+2}) \quad (1)$$

$$\begin{aligned} (c) \text{ Expand and simplify } &5(\overset{x}{y-2}) + 2(\overset{x}{y-3}) \\ &\begin{array}{r} 5y - 10 + 2y - 6 \\ \hline 7y - 16 \end{array} \quad (1) \\ &7y - 16 \quad (2) \end{aligned}$$

$$(d) \text{ Simplify } m^5 \times m^3 \quad (1)$$

$$\begin{aligned} (e) \text{ Simplify } &\frac{p^6}{p^2} \quad (1) \\ &p^4 \quad (1) \end{aligned}$$

$$\begin{aligned} (f) \text{ Estimate the width of this pine cone.} \\ \text{The cone of best fit and cones with a} \\ \text{length will be:} \quad (1) \\ &6.2 \quad (1) \quad (1) \\ (g) \text{ Another pine cone from this tree has a length of 8.4 cm.} \\ (h) \text{ Estimate the width of this pine cone.} \quad (1) \\ &6.2 \quad (1) \quad (2) \end{aligned}$$

(Total for Question 2 is 3 marks)

November 2014 (Calculator)

68

November 2014 (Calculator)

69

• green counters, some yellow counters, some blue counters and some
a bag.

• shows the probabilities that a counter taken at random from the bag will be
a yellow or red.

Colour	Green	Yellow	Blue	Red
Probability	0.16	0.4	0.2	0.24

Mary takes at random a counter from the bag.

(a) Work out the probability that the counter will be blue.

$$\textcircled{1} \quad 0.16 + 0.4 + 0.24 = 0.8$$

$$\textcircled{2} \quad 1 - 0.8 = 0.2$$

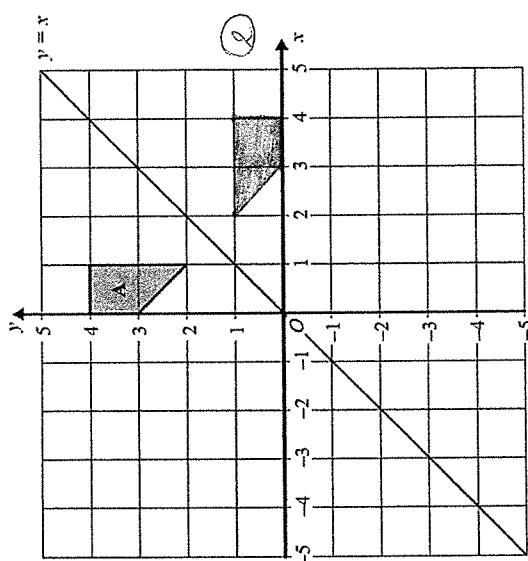
Mary puts the counter back into the bag.
There are 125 counters in the bag.

(b) Work out the number of green counters in the bag.

$$\textcircled{1} \quad 125 \times 0.16 = 20$$

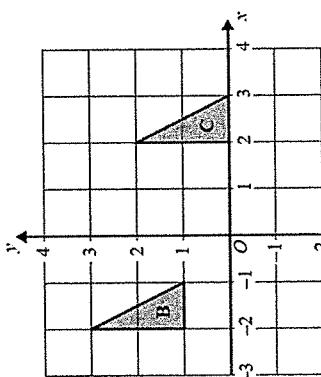
$$\textcircled{2} \quad 0.2$$

(Total for Question 5 is 4 marks)



(a) On the grid, reflect shape A in the line $y = x$.

(2)



(b) Describe fully the single transformation that maps triangle B onto triangle C.

Translation $\begin{pmatrix} 4 \\ -1 \end{pmatrix} \rightarrow \text{west and translation}$

(1) (2)

(Total for Question 4 is 4 marks)

November 2014 (Calculator)

69

November 2014 (Calculator)

10

- *9. The table gives some information about student attendance at a school on Friday.

Number of students			
Year	Present	Absent	Total
Year 7	192	16	208
Year 8	219	22	241
Year 9	234	28	262
Year 10	233	28	261
Year 11	214	24	238

The school has a target of 94% of students being present each day.

Did the school meet its target on Friday?

$$\begin{array}{r}
 192 \\
 \times 19 \\
 \hline
 1728 \\
 + 190 \\
 \hline
 3618
 \end{array}
 \qquad
 \begin{array}{r}
 208 \\
 \times 19 \\
 \hline
 1872 \\
 + 200 \\
 \hline
 388
 \end{array}
 \qquad
 \begin{array}{r}
 992 \\
 \times 19 \\
 \hline
 1210
 \end{array}
 \qquad
 \begin{array}{r}
 81.98\% \\
 \approx \\
 81.98\%
 \end{array}$$

81.98% is smaller than μ_1

$X = 5.1$ since 122.451 is the closest value to $\underline{125}$

$x = \dots$

(Total for Question 9 is 3 marks)

$$x^3 - 2x = 125$$

has a solution between 5 and 6.

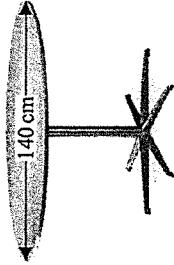
Use a trial and improvement method to find this solution.
Give your answer correct to 1 decimal place.
You must show all your working.

χ	$\chi^3 - 2\chi = 125$	Too big/small
5	145	too small
6	204	too big
5.5	155.375	too big
5.2	130.208	too big
5.1	122.454	too small

$\mathcal{N} = 5.1$ since 122.451 is the closest value to 125

$x = \dots$

- *11. Saphia is organising a conference.
People at the conference will sit at circular tables.



Each table has a diameter of 140 cm.
Each person needs around 60 cm around the circumference of the table.

There are 12 of these tables in the conference room.
A total of 90 people will be at the conference.

Are there enough tables in the conference room?

$$C = \pi \times D$$

$$= \pi \times 140 \approx 439.823 \text{ cm}$$

$$439.823 : 60 \approx 7.33$$

≈ 7 persons on each table

$12 \times 7 \approx 88$ people overall

\Rightarrow There are not enough tables since only 188 persons approx.

(Total for Question 11 is 4 marks)

12. On the grid, draw the graph of $y = 2x - 3$ for values of x from -2 to 3
~~or 1 for at least 3 points~~

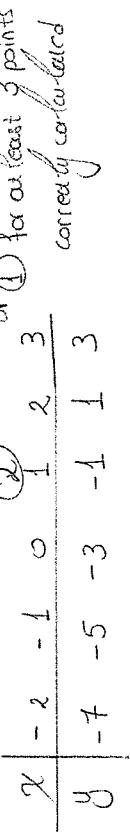
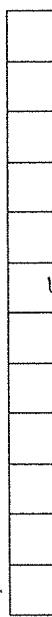


Diagram NOT accurately drawn



Each table has a diameter of 140 cm.
Each person needs around 60 cm around the circumference of the table.

There are 12 of these tables in the conference room.
A total of 90 people will be at the conference.

Are there enough tables in the conference room?

$$C = \pi \times D$$

$$= \pi \times 140 \approx 439.823 \text{ cm}$$

$$439.823 : 60 \approx 7.33$$

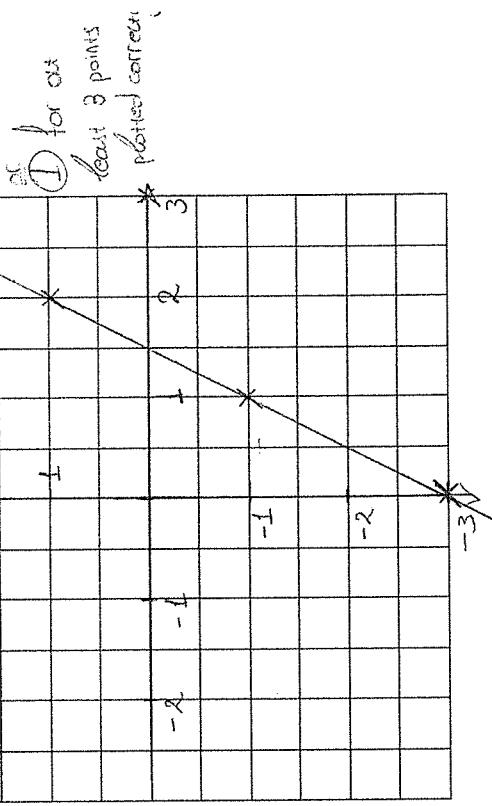
≈ 7 persons on each table

$12 \times 7 \approx 88$ people overall

\Rightarrow There are not enough tables since only 188 persons approx.

(Total for Question 11 is 4 marks)

12. On the grid, draw the graph of $y = 2x - 3$ for values of x from -2 to 3
~~or 1 for at least 3 points~~



(Total for Question 12 is 4 marks)

19. Louise makes a spinner.

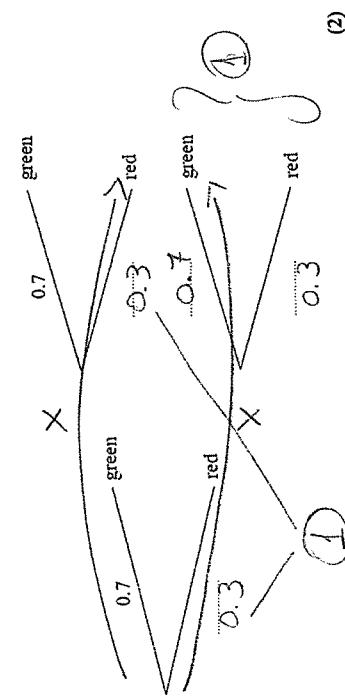
The spinner can land on green or on red.

The probability that the spinner will land on green is 0.7

Louise spins the spinner twice.

- (a) Complete the probability tree diagram.

First spin



- (b) Work out the probability that the spinner lands on two different colours.

$$\begin{aligned} & ① \\ & 0.49 \times 0.3 = 0.21 \\ & 0.3 \times 0.7 = 0.21 + \\ & \underline{0.42} \quad ① \end{aligned}$$

.....
(3)
(Total for Question 19 is 5 marks)

PAST PAPER SET C (June 2015)

1. Here are the heights in centimetres of 20 men.

165	164	176	179	188	178	183	172	180	190
167	159	156	176	173	168	169	182	167	192

- (a) Show this information in an ordered stem and leaf diagram.

Try out:

15	9 6
16	5 4 7 8 9 7
17	6 9 8 2 6 3
18	8 3 0 2
19	0 2

15	6 9
16	4 5 7 7 8 9
17	2 3 6 6 8 9
18	0 2 3 8
19	0 2

- (b) Work out the percentage of these men with a height greater than 184 cm.

$$\frac{3}{20} \times \frac{5}{100\%} = 15\%$$

(Total for Question 1 is 5 marks)

2. $x = 3$

(a) Work out the value of $4x^2$

$$= 4 \times x \times x$$

$$= 4 \times 3 \times 3 = 36$$

..... (1)

- (a) Show this information in an ordered stem and leaf diagram.

(b) Work out the value of $5x + 4 = 14 + x$

$$\begin{array}{r} 5x + 4 = 14 + x \\ -x \\ \hline 4x + 4 = 14 \\ -4 \\ \hline 4x = 10 \\ \frac{4x}{4} = \frac{10}{4} \\ x = 2.5 \end{array}$$

..... (2)

3. Sean works for a town council.
He wants to find out how often people use the BMX track in the town.
He is going to use a questionnaire.

Design a suitable question for Sean to use in his questionnaire.

How often do you use the BMX track per week?
..... (3)

$$\begin{array}{r} 0-1 \quad 1-3 \quad 4-5 \quad 6+ \\ \text{times} \quad \text{times} \quad \text{times} \quad \text{times} \end{array}$$

..... (2)

(Total for Question 3 is 2 marks)

JUNE 2015 (Non calculator)

JUNE 2015 (Non calculator)

75

75

- *4. (a) Tom is going to buy 25 plants to make a hedge.

Here is information about the cost of buying the plants.

Kirsty's Plants	
£2.39 each	

Tom wants to buy the 25 plants as cheaply as possible.

Should Tom buy the plants from Kirsty's Plants or from Hedge World?
You must show all your working.

Kirsty's Plants

$$2.39 \times 25$$

Break it down:

$$10 \text{ plants} = £23.90$$

$$\begin{array}{r} 10 \text{ plants} = \\ 5 \text{ plants} = \end{array} \begin{array}{r} 11.95 \\ 5.975 \\ \hline 11.95 \end{array}$$

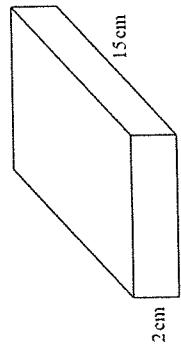
5 plants?
 2.39
 2.39
 2.39
 2.39
 2.39
 \hline
 £11.95

Should buy from
Kirsty's Plants ~~X~~

(Total for Question 4 is 5 marks)

5. Jane makes cheese.
The cheese is in the shape of a cuboid.

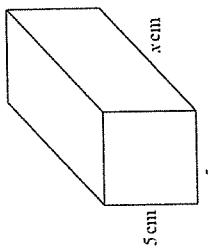
Diagram NOT
accurately drawn



Jane is going to make a new cheese.

The new cheese will also be in the shape of a cuboid.
The cross section of the cuboid will be a 5 cm by 5 cm square.

Diagram NOT
accurately drawn



Work out the value of x.
Jane wants the new cuboid to have the same volume as the 2 cm by 10 cm by 15 cm cuboid.

Cheese volume: $2 \times 10 \times 15 = 300 \text{ cm}^3$

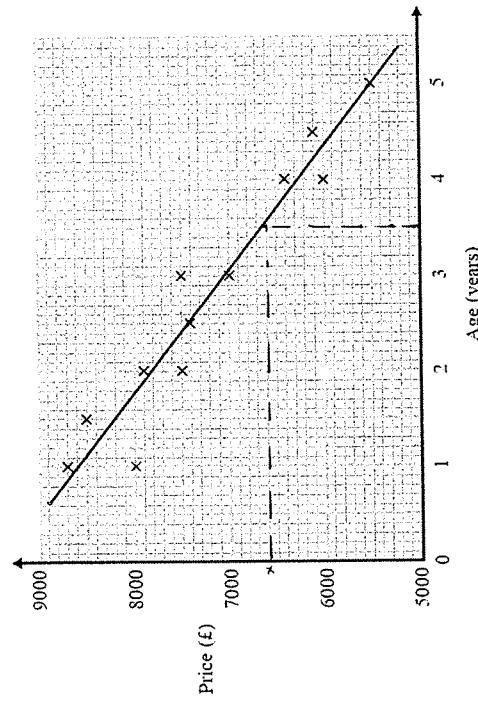
$$\text{So, } 5 \times 5 \times x = 300$$

$$25x = 300$$

$$x = \frac{300}{25} = 12$$

(Total for Question 5 is 3 marks)

6. The scatter graph shows information about the age and the price of each of 12 cars of the same model.



- (a) Describe the relationship between the age of a car and its price.

As age of car goes up, the price goes down. Negative correlation

(1)

A different car of the same model is $3\frac{1}{2}$ years old.

- (b) Estimate the price of this car.

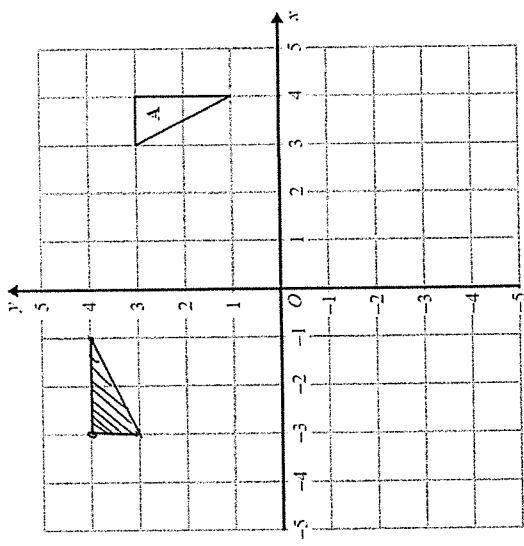
Draw line of best fit first.

[Read your answer based on
your line or best fit] £..... 6600

(2)

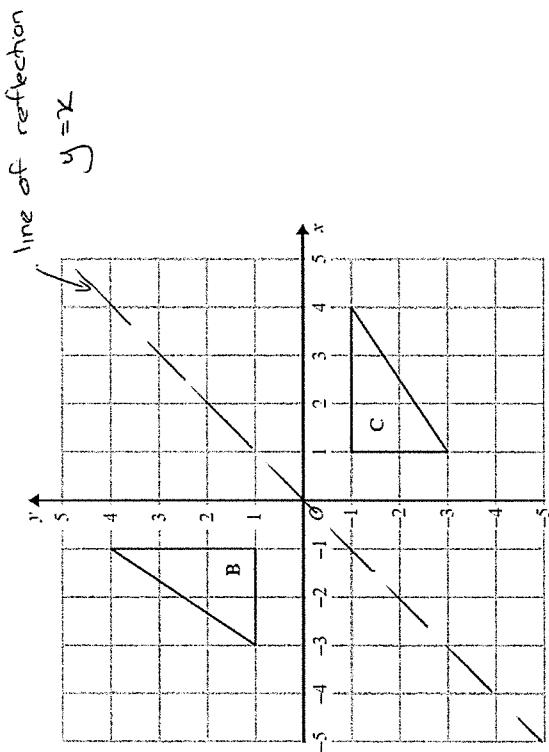
(Total for Question 6 is 3 marks)

- 7.



- (a) Rotate triangle A 90° anticlockwise with centre O.

(2)



(b) Describe fully the single transformation that maps triangle B onto triangle C.

~~Reflection on the line $y = x$~~

(Total for Question 7 is 4 marks)

8. (a) Simplify $6g - 5h - 4g + 2h$

$$2g - 3h \quad (2)$$

(b) Factorise $y^2 - 2y$

$$y(y-2) \quad (1)$$

(c) Simplify fully $\frac{p^3 \times p^4}{p^2}$

$$\frac{p^7}{p^2} = p^{7-2} = p^5$$

(Total for Question 8 is 5 marks)

9. John buys some boxes of pencils and some packets of pens for people to use at a conference.

There are 40 pencils in a box.
There are 15 pens in a packet.

John gives one pencil and one pen to each person at the conference.
He has no pencils left.
He has no pens left.

How many boxes of pencils and how many packets of pens did John buy?

$$\begin{array}{l} \text{Box: } 40, 80, \cancel{120}, 160, 200 \\ \text{Packet: } 15, \cancel{30}, 45, \cancel{60}, 75, \cancel{90}, 105, \cancel{120} \end{array}$$

3 boxes of pencils
8 packets of pens

(Total for Question 9 is 3 marks)

- *10. The diagram shows the floor plan of Mary's conservatory.

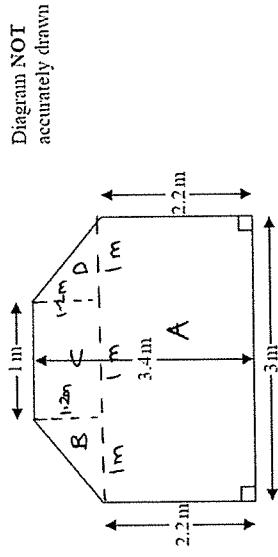


Diagram NOT accurately drawn

Mary is going to cover the floor with tiles.

The tiles are sold in packs.
One pack of tiles will cover 2 m^2 .
A pack of tiles normally costs £24.80.
Mary gets a discount of 25% off the cost of the tiles.

Mary has £100.

Does Mary have enough money to buy all the tiles she needs?
You must show all your working.

Split into many shapes: $A = 3 \times 2.2 = 6.6 \text{ m}^2$

$$B = 1.2 \times 1 = 1.2 \div 2 = 0.6 \text{ m}^2$$

$$C = 1.2 \times 1 = 1.2 \text{ m}^2$$

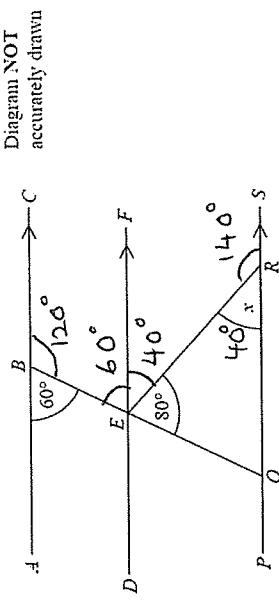
$$D = \text{same as } B = \frac{0.6 \text{ m}^2}{\text{Total area: } 9 \text{ m}^2}$$

~~1 pack covers: 2 m^2~~
So, need 5 packs

$$\begin{array}{r} \text{Cost: } 5 \times \text{£}24.80 = \text{£}124 \\ \text{25\%} = \frac{10}{10} = 12.40 \\ \text{5\%} = \frac{10}{50} = 1.20 \\ \hline \text{£}31.00 \end{array}$$

(Total for Question 10 is 5 marks)

*12.



ABC , DEF and $PQRS$ are parallel lines.
 BEO is a straight line.

Angle $ABE = 60^\circ$
Angle $QER = 80^\circ$

Work out the size of the angle marked x .
Give reasons for each stage of your working.

$$x = \underline{\underline{40^\circ}}$$

Angles on a straight line $= 180^\circ$

Angles on a triangle add up to $= 180^\circ$

13. Here is a rectangle.



Diagram NOT
accurately drawn

The 8-sided shape below is made from 4 of these rectangles and 4 congruent right-angled triangles.

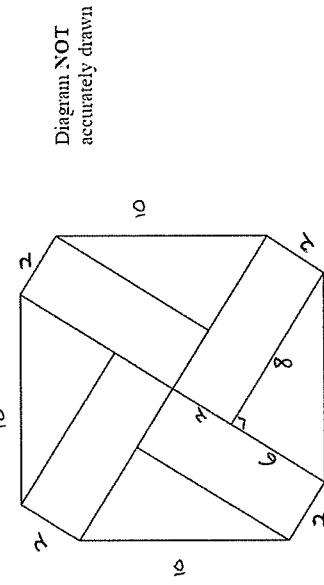


Diagram NOT
accurately drawn

Work out the perimeter of the 8-sided shape.
You must show all your working.

? \rightarrow use Pythagoras theorem: $6^2 + 8^2 = 100$

$$\sqrt{100} = 10$$

So, perimeter: $2 + 2 + 2 + 2 + 10 + 10 + 10 + 10$

$$= \underline{\underline{48 \text{ cm}}}$$

48

.....cm

(Total for Question 13 is 5 marks)

JUNE 2015 (Non calculator)

80

JUNE 2015 (Non calculator)

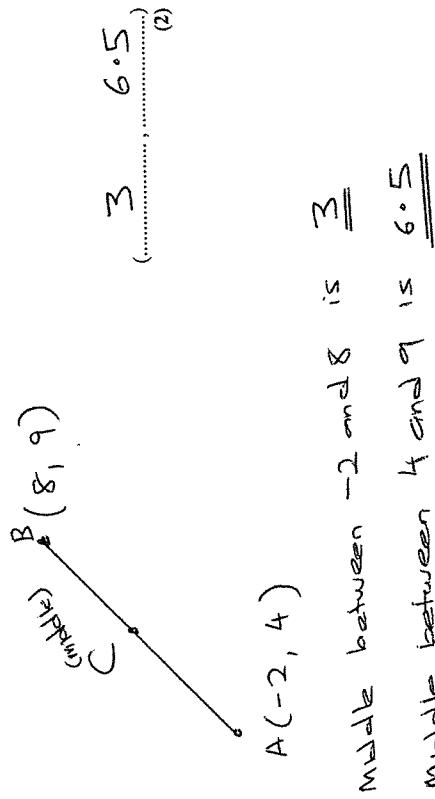
80

15. A and B are two points.

Point A has coordinates $(-2, 4)$.
Point B has coordinates $(8, 9)$.

C is the midpoint of the line segment AB .

(a) Find the coordinates of C .



16. The table shows information about the times taken by 100 people in a fun run.

Time (t minutes)	Frequency
$20 < t \leq 30$	4
$30 < t \leq 40$	16
$40 < t \leq 50$	36
$50 < t \leq 60$	24
$60 < t \leq 70$	14
$70 < t \leq 80$	6

(a) Complete the cumulative frequency table for this information.

Time (t minutes)	Cumulative frequency
$20 < t \leq 30$	4
$20 < t \leq 40$	20
$20 < t \leq 50$	56
$20 < t \leq 60$	80
$20 < t \leq 70$	94
$20 < t \leq 80$	100

(b) On the grid, draw a cumulative frequency graph for your table.

(Total for Question 15 is 2 marks)

assume it's =

18. On the grid show, by shading, the region that satisfies all three of the inequalities

$$\begin{aligned}x+y &< 7 \\y &< 2x \\y &> 3\end{aligned}$$

Label the region R.
This is like drawing straight line. Draw the line for each with just two numbers, then draw all lines.
Shade the 'trapped' region.

$$y = 2x$$

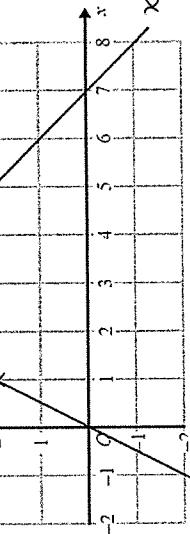
$$x+y = 7$$

x	1	2
y	6	5

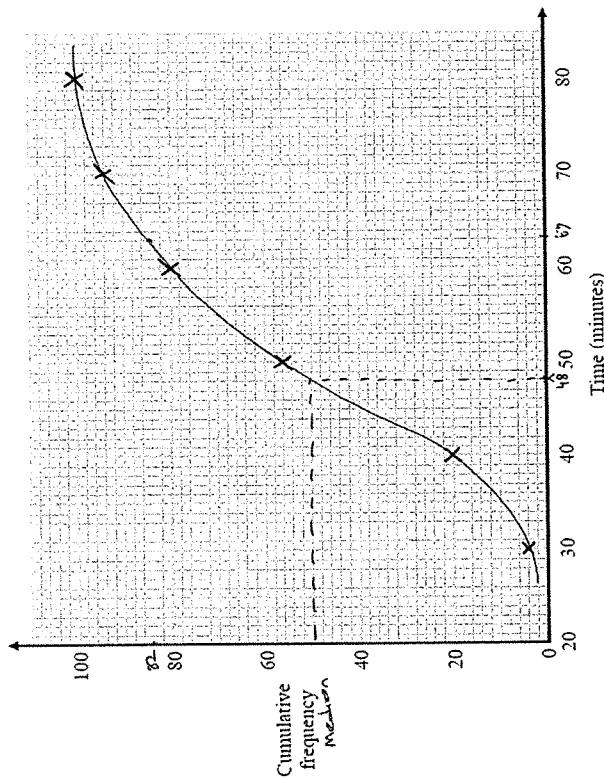


$$y = 2x$$

x	1	2
y	2	4



(Total for Question 18 is 4 marks)



- (c) Use your graph to find an estimate for the median time.

$$48 \text{ minutes (1)}$$

- (d) Use your graph to find an estimate for the number of people who took longer than 63 minutes.

$$82 \text{, then take away from } 100 - 82 = 18 \text{ } 18 \text{ (2)}$$

(Total for Question 16 is 6 marks)

PAST PAPER SET C (June 2015)

2. The equation

$$x^3 - x^2 = 30$$

1. Udit has a bag of chocolate sweets.

There are 30 sweets in the bag.

This table shows the types of sweets in the bag.

	Strawberry	Caramel	Nut
Dark chocolate	3	1	6
Milk chocolate	4	5	2
White chocolate	1	4	4

Udit takes at random a sweet from the bag.

- (a) Write down the probability that the sweet is a dark chocolate caramel.

$$\frac{1}{30} \quad (1)$$

- (b) Work out the probability that the sweet is a white chocolate.

$$\frac{9}{30} \quad (2)$$

There are some dark chocolates, some milk chocolates and some white chocolates in a box.

The table below shows the probabilities that a chocolate taken at random from the box is a dark chocolate or is a milk chocolate.

Probability	Dark chocolate	Milk chocolate	White chocolate
0.35	0.35	0.17	0.48

A chocolate is taken at random from the box.

- (c) Work out the probability that the chocolate is a white chocolate.

$$0.35 + 0.17 = 0.52 \quad 0.48 \quad (2)$$

(Total for Question 1 is 5 marks)

has a solution between 3 and 4.

- Use a trial and improvement method to find this solution.
Give your answer correct to one decimal place.
You must show ALL your working.

$$\begin{array}{|c|c|} \hline x & x^3 - x^2 = 30 \\ \hline \end{array}$$

$$\begin{array}{|c|c|} \hline 3 & 3^3 - 3^2 = 18 \quad \text{low} \\ \hline \end{array}$$

$$\begin{array}{|c|c|} \hline 4 & 4^3 - 4^2 = 48 \quad \text{high} \\ \hline \end{array}$$

$$\begin{array}{|c|c|} \hline 3.5 & 30.625 \quad \text{bit high} \leftarrow \text{close} \\ \hline \end{array}$$

$$\begin{array}{|c|c|} \hline 3.4 & 27.74 \quad \text{low} \\ \hline \end{array}$$

$$\begin{array}{|c|c|} \hline \text{So, try } 3.48 & 30.033 \ldots \text{ bit high but} \\ \hline & \text{round to one decimal} \\ \hline & \text{place} \end{array}$$

(Total for Question 2 is 4 marks)

$$\begin{array}{|c|c|} \hline & \sqrt{70.25} \\ \hline & 4.2 - 2.37 \\ \hline \end{array}$$

- (a) Write down all the figures on your calculator display.
You must give your answer as a decimal.

use $\frac{\pi}{\square}$ button in your calculator

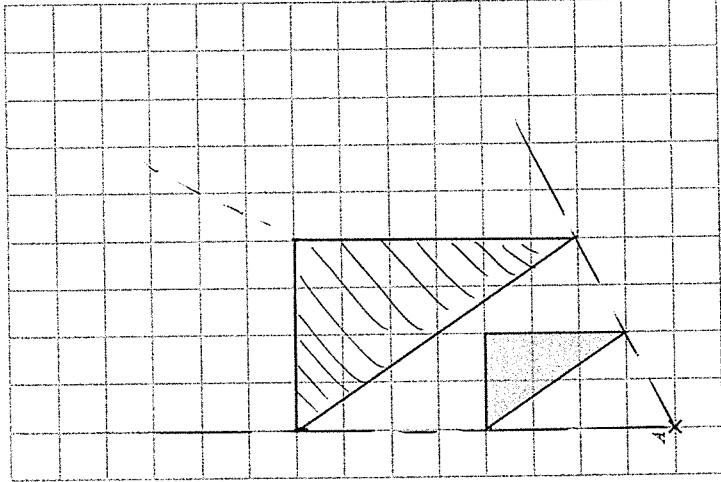
$$4.580069567 \quad (2)$$

- (b) Write your answer to part (a) correct to 4 decimal places.

$$4.5801 \quad (1)$$

(Total for Question 3 is 3 marks)

4. A shaded shape is shown on the grid.



- *5 Redlands School sent x students to a revision day.
St Samuel's School sent twice as many students as Redlands School.
Francis Long School sent 7 fewer students than Redlands School.

Each student paid £15 for the revision day.
The students paid a total of £1155.

Work out how many students were sent by each school to the revision day.
You must show all your working.

$$\begin{array}{c|c|c} \text{Redlands} & \text{St Samuel's} & \text{Francis} \\ \hline x & 2x & x - 7 \\ \hline \text{total students} & = 4x - 7 \end{array}$$

$$\text{if } 1155 \div 15 = 77$$

$$\text{so, } 4x - 7 = 77$$

$$x = \frac{77 + 7}{4} = 21$$

(Total for Question 5 is 5 marks)

$$\text{So, Redlands} = x^2 = 21$$

$$\text{St Samuel's} = 2x^2 = 42$$

(Total for Question 5 is 5 marks)

$$\text{Francis} = x^2 - 7 = 14$$

(Total for Question 4 is 2 marks)

- *6. Coffee sachets are sold in three different sizes of box.

	12	£5.65	small
	20	£9.20	medium
	35	£15.75	large

A small box has 12 coffee sachets and costs £5.65.

A medium box has 20 coffee sachets and costs £9.20.
A large box has 35 coffee sachets and costs £15.75.

Work out which size of box gives the best value for money.

You must show all your working.

<small>Small</small> each costs	<small>Medium</small> each costs	<small>Large</small> each costs
$5.65 \div 12$	$9.20 \div 20$	$15.75 \div 35$
= £0.4708...	= £0.46	£0.45

cheapest:

Large box best value for money

(Total for Question 6 is 4 marks)

7. (a) Expand $\overbrace{7(x+5)}$

$$7x + 35$$

(1)

7. (a) Expand $\overbrace{3y(4y-3)}$

$$3y \times 4y = 12y^2$$

$$3y \times (-3) = -9y$$

(1)

7. (b) Expand $\overbrace{3y(4y-3)}$

$$3y \times 4y = 12y^2$$

$$3y \times (-3) = -9y$$

(1)

7. (c) Expand and simplify $\overbrace{(r+2)(r+4)}$

$$r^2 + 4r + 2r + 8$$

$$r^2 + 6r + 8$$

(Total for Question 7 is 4 marks)

8. Sandra has a piece of string 153 cm long.
She cuts the string into three lengths in the ratio 4 : 2 : 3.

Work out the length, in centimetres, of each piece of string.

$$4 + 2 + 3 = 6$$

$$153 \div 9 = 17$$

$$\begin{array}{r} 4 : 2 : 3 \\ \times 17 \quad \times 17 \quad \times 17 \\ \hline 68 : 34 : 51 \end{array}$$

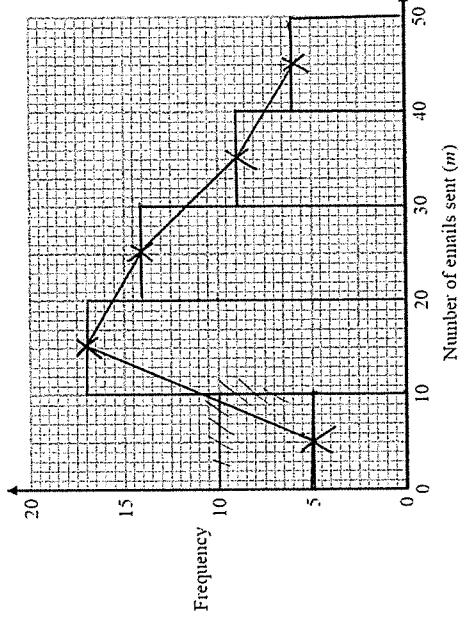
$$\begin{array}{r} 68 \\ \hline 34 \\ \hline 51 \end{array}$$

(Total for Question 8 is 3 marks)

9. The frequency table gives information about the numbers of emails sent by 51 teachers on Monday.

Number of emails sent (m)	Frequency
$0 < m \leq 10$	5
$10 < m \leq 20$	17
$20 < m \leq 30$	14
$30 < m \leq 40$	9
$40 < m \leq 50$	6

(a) On the grid below, draw a frequency polygon for this information.



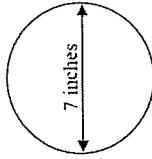
(b) Nalini says that at least a quarter of these teachers sent more than 30 emails.

Is Nalini correct?
You must explain your answer.

$\frac{1}{4}$ of 51 = 12.75 (NOT 15) So, she is wrong.

- *11. The diagram shows the top of Levi's birthday cake.

Diagram NOT
accurately drawn



The top of the cake is in the shape of a circle.
The diameter of the circle is 7 inches.
A ribbon is going to be put around the side of the cake.
Ribbons are sold in 50 cm lengths.

1 inch is 2.54 cm.

Work out if one length of ribbon is long enough to go all the way around the cake.
You must show your working.

$$\begin{aligned}
 \pi \times 2.54 &= 17.78 \text{ cm (diameter)} \\
 17.78 \div 2 &= 8.89 \text{ cm (radius)} \quad (\text{No need to find the circumference} = \pi \times d) \\
 &= 3.14 \times 17.78 \\
 &= 55.8292 \text{ cm} \\
 \text{So, } 50 \text{ cm ribbon is } \underline{\underline{\text{NOT}}} \text{ long enough.}
 \end{aligned}$$

(Total for Question 11 is 4 marks)

$$\frac{1}{4} \text{ of } 51 = \underline{12.75} \text{ (NOT 15)} \quad \text{So, she is } \underline{\underline{\text{wrong}}}$$

(Total for Question 9 is 4 marks)

13. Martin and Janet are in an orienteering race.
 Martin runs from checkpoint A to checkpoint B, on a bearing of 065° .
 Janet is going to run from checkpoint B to checkpoint A.

Work out the bearing of A from B. β

$$\beta = 360 - 115 = \underline{245}^{\circ}$$

(Total for Question 13 is 2 marks)

14. Suneeet records the times, in minutes, for 40 runners to finish a half marathon.

Information about these times is shown in the table.

Time (t minutes)	Frequency
60 < $t \leq 90$	$10 \times \cancel{75} =$
90 < $t \leq 120$	$14 \times \cancel{105} =$
120 < $t \leq 150$	$9 \times \cancel{135} =$
150 < $t \leq 180$	$5 \times \cancel{165} =$
180 < $t \leq 210$	$2 \times \cancel{195} =$
	<u>4650</u>

Calculate an estimate for the mean time.

$$\text{Mean} = \frac{4650}{40} = \underline{\underline{116.25}}$$

(Total for Question 13 is 2 marks)

$$116.25 \text{ minutes}$$

(Total for Question 14 is 4 marks)

Use calculator

15. (a) Work out the value of 25^{-3}

$$\frac{1}{15625} \text{ or } 6.4 \times 10^{-5} \quad (1)$$

(b) Work out the value of 350^3
Give your answer in standard form.

$$= 42875000 \quad (1)$$

$$= 4.2875 \times 10^7 \quad (2)$$

(Total for Question 15 is 3 marks)

18. The owners of a car park recorded the number of cars parked at 12 noon each day.

The table shows information about the number of cars parked in the car park at 12 noon each day in July and in December.

	July	December
Least number of cars	75	100
Lower quartile	90	115
Median	95	130
Upper quartile	150	150
Greatest number of cars	178	180

- (a) What type of diagram could you draw to represent the information for each month?

Box plot (1)

- *(b) Compare the distribution of the number of cars recorded in July with the distribution of the number of cars recorded in December.

Median in July less than median in December.
Then compare any other two things from the table

(2)
(Total for Question 18 is 3 marks)

20. Show that $(n+3)^2 - (n-3)^2$ is an even number for all positive integer values of n .

- (Even if you expand one of the bracket correctly, you can get 1 mark)!!

- (b) Don't ignore, just try to get that 1 mark!!!

$$(n+3)^2 = (n+3)(n+3)$$

$$= n^2 + 3n + 3n + 9$$

$$= n^2 + 6n + 9$$

$$(n-3)^2$$

$$= n^2 - 6n + 9$$

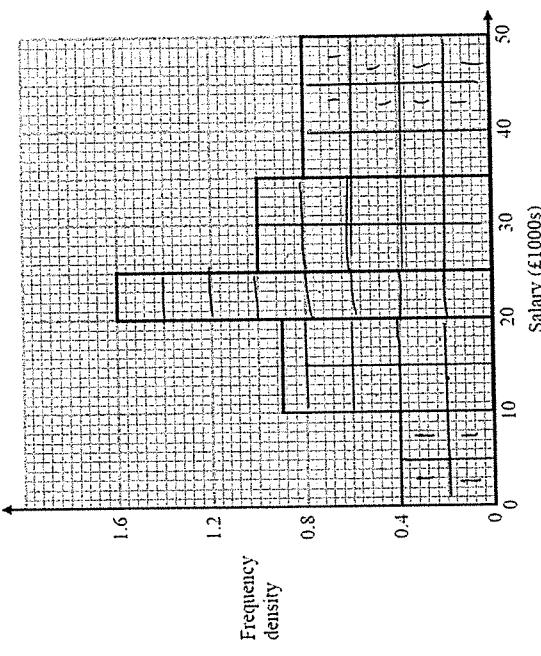
$$= 12n$$

- (a) What type of diagram could you draw to represent the information for each month?

Box plot (1)

- *(b) Compare the distribution of the number of cars recorded in July with the distribution of the number of cars recorded in December.

Median in July less than median in December.
Then compare any other two things from the table



(a) Use the histogram to complete the frequency table.

Salary (p) in £1000s	Frequency
$0 < p \leq 10$	4
$10 < p \leq 20$	9
$20 < p \leq 25$	8
$25 < p \leq 35$	10
$35 < p \leq 50$	12

\leftarrow So each big square worth 4.

(b) Work out the proportion of people in the sample who have a salary greater than £40 000.

$$\frac{8}{43}$$

(Total for Question 26 is 4 marks)

PAST PAPER SET D (Nov 2015)

- 2 Use the fact that
 $5.4 \times 36 = 194.4$

- 1 Sean wants to go on holiday.
 He is going to get a loan of £720 to help pay for the holiday.
 Sean will have to pay back the £720 plus interest of 15%.
 He will pay this back in 12 equal monthly instalments.
 How much money will Sean pay back each month?

$$\begin{aligned} 15\% \text{ of } £720 &= £108 \quad \textcircled{1} \\ £720 + £108 &= £828 \quad \textcircled{1} \\ £828 \div 12 &= £69 \quad \textcircled{1} \end{aligned}$$

$$\begin{aligned} 10\% \text{ of } £720 &= £72 \\ 5\% \text{ of } £720 &= £36 \\ 15\% &= £108 \end{aligned}$$

- 2 Use the fact that
 $5.4 \times 36 = 194.4$

to find the value of

(i) 5.4×3.6

18.24
estim.
 $5 \times 4 = 20$

(ii) 54×360

19440
estim.
 $50 \times 400 = 20,000$

(Total for Question 2 is 2 marks)

- 3 Here are the first four terms of an arithmetic sequence.

$$\begin{array}{ccccccccc} 5 & & 11 & & 17 & & 23 & & 29 \\ & \nearrow & & \nearrow & & \nearrow & & \nearrow & \\ & 6 & & 6 & & 6 & & 6 & \end{array}$$

- (a) Find, in terms of n , an expression for the n th term of this arithmetic sequence.

$$6n + 5 \quad \textcircled{1}$$

- (b) Is 121 a term of this arithmetic sequence?

You must explain your answer.

No $\dots 29, 35, 41, 47, 53, 59, 65, 71, 77, 83, 89, 95, \dots$
 $\dots 101, 107, 113, 119, 125$ $\textcircled{2}$

Or $6n + 5 = 121$
 $6n = 116$ solution not an integer
 $\textcircled{2}$

(2)
 (Total for Question 3 is 4 marks)

E.....
 (Total for Question 1 is 4 marks)

- 4 There are some black pens, some blue pens, some red pens and some green pens in a box.

The table shows the probabilities that a pen taken at random from the box will be black or will be blue or will be red.

colour	black	blue	red	green
probability	0.3	0.2	0.4	

There are 200 pens in the box.

- (a) Work out the number of black pens in the box.

$$200 \times 0.3 = 60 \quad (1)$$

$$1 - (0.3 + 0.2 + 0.4) = 0.1 \quad (1)$$

A pen is taken at random from the box.

- (b) Work out the probability that the pen will be green.

$$1 - (0.3 + 0.2 + 0.4) = 0.1 \quad (1)$$

.....(2)

(Total for Question 4 is 4 marks)

- 5 Here are the ingredients needed to make 8 shortbread biscuits.

Shortbread biscuits makes 8 biscuits
120 g butter
60 g caster sugar
180 g flour

Tariq is going to make some shortbread biscuits.

He has the following ingredients

$$330 \text{ g butter} \quad (1)$$

$$200 \text{ g caster sugar} \quad (1)$$

Work out the greatest number of shortbread biscuits that Tariq can make with his ingredients.
You must show all your working.

.....(2)

$$120 \text{ g } \times 2.75 = 330 \text{ g} \quad (1)$$

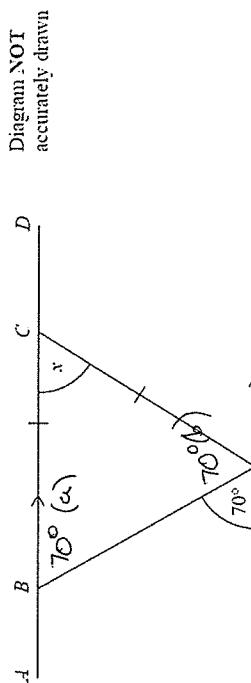
$$2.75 \times 8 = 22 \text{ biscuits} \quad (1)$$

$$\begin{array}{l} 60 \text{ g } \times 3\frac{1}{3} = 200 \text{ g} \\ 3\frac{1}{3} \times 8 = 26\frac{2}{3} \end{array} \quad (1)$$

$$\begin{array}{l} \text{Enough butter for 22 biscuits} \\ \text{Enough caster sugar for 26 biscuits} \\ \text{Enough flour for 20 biscuits} \\ \text{Enough ingredients for 20 biscuits} \end{array} \quad (1)$$

..... biscuits
(Total for Question 5 is 3 marks)

*6



*ABCD and EFG are parallel lines.
BC = CF
Angle BFE = 70°*

*Work out the size of the angle marked x.
Give reasons for each stage of your working.*

(a) Angle $\hat{C}BF = \hat{BFE} = 70^\circ$ ①
(*alternate angles are equal*)

(b) Angle $\hat{C}BF = \hat{C}FB = 70^\circ$ ①
(*base angles in isosceles triangle*
are equal - BC is same length
as CF, so triangle CBF is isosceles)

(c) $x = 180^\circ - (70^\circ + 70^\circ) = 40^\circ$ ①
(*angles in a triangle add to 180°*)

All reasons stated in full ①

(Total for Question 6 is 4 marks)

- 7 Martin wants to find out how often students use the local tram service.
He uses this question on a questionnaire.

How often do you use the local tram service?		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a little	sometimes	a lot

(a) Write down two things wrong with this question.

1. No time frame ①
2. no box for never ①

3. answers agree / not unique ①

(b) Design a better question for a questionnaire for Martin to find out how often students use the local tram service.

*How often do you use the local tram service per week?
[most include time frame]*



① at least 3 boxes

① no gaps or overlaps

(2)
(Total for Question 7 is 4 marks)

November 2015 (Non calculator) 92

November 2015 (Non calculator) 92

- 8 Milk is sold in $\frac{1}{2}$ pint bottles, in 1 pint bottles and in 2 pint bottles.
One weekend a shop sold 100 bottles of milk.

46 of the bottles were sold on Saturday.
15 of the bottles sold on Sunday were 2 pint bottles.
31 of the bottles sold on Saturday were $\frac{1}{2}$ pint bottles.
22 of the bottles sold were 2 pint bottles.
30 of the bottles sold were 1 pint bottles.

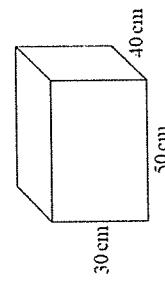
How many 1 pint bottles were sold on Sunday?

	Saturday	Sunday	Total
$\frac{1}{2}$ pint	31		30
1 pint		15	22
2 pints			100
Total		46	

$$\begin{aligned}
 \text{Bottles sold on Saturday} &= 100 - (30 + 22) = 48 \quad \text{(1)} \\
 \text{OR total } \frac{1}{2} \text{ pint bottles} &= 100 - (30 + 22) = 48 \quad \text{(1)} \\
 \text{OR total 2 pint bottles} &= 100 - 48 = 52 \quad \text{(1)} \\
 \text{Total } \frac{1}{2} \text{ pint Sunday bottles} &= "48" - 31 = 17 \quad \text{(1)} \\
 \text{OR total 1 pint Saturday bottles} &= "54" - 31 - (22 - 15) = 16 \quad \text{(1)} \\
 1 \text{ pint bottles sold on Sunday} &= 46 - 15 - "17" \quad \text{(1)} \\
 &= 14 \quad \text{(1)}
 \end{aligned}$$

(Total for Question 8 is 4 marks)

- *9 The diagram shows a container for oil.
The container is in the shape of a cuboid.
One has to fill the container with oil.



A bottle of oil costs £3.50.
There are 3000 cm³ of oil in each bottle.

Sally must not spend more than £60 buying the oil.
Can Sally buy enough oil to fill the container?
You must show all your working.

$$\begin{aligned}
 \text{Volume of container} &= 30 \times 40 \times 50 \quad \text{(1)} \\
 &= 60,000 \text{ cm}^3 \\
 \text{Number of bottles of oil needed to fill it} &= 60,000 \div 3,000 \quad \text{(1)} \\
 &= 20 \\
 \text{Cost of filling container} &= £3.50 \times 20 \\
 &= £70 \\
 \text{No, as } £60 &< £70
 \end{aligned}$$

(Total for Question 9 is 4 marks)

(Total for Question 8 is 4 marks)

November 2015 (Non calculator)

93

95

10 (a) Expand $x(x+2)$

$$x^2 + 2x \quad (1)$$

(b) Expand and simplify $3(y+2) + 4(x-1)$

$$3y + 6 + 4x - 4$$

① if one bracket & expanded correctly

(c) Expand and simplify $(2t-3)(t+5)$

$$2t^2 + 10t - 3t - 15$$

① if at least 3 terms correct
or all 4 ignoring +

(d) Factorise fully $8a^2 + 12a$

$$\begin{aligned} \text{① for } 2a(4a+6) \text{ or } a(8a+12) \\ \text{or } 4a(2a+3) \quad (2) \end{aligned}$$

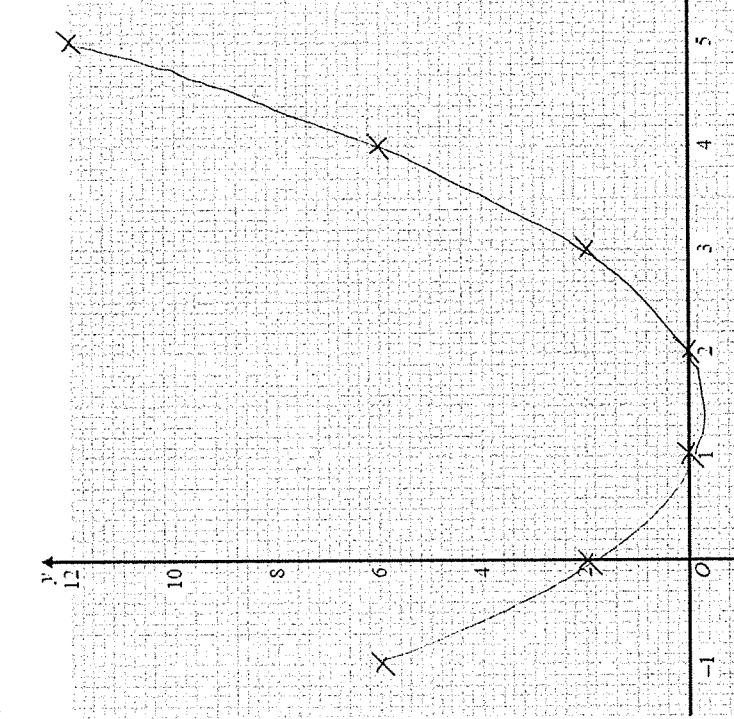
12 (a) Complete the table of values for $y = x^2 - 3x + 2$

x	-1	0	1	2	3	4	5
y	6	2	0	0	2	6	12

① for at least two correct

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x + 2$ for values of x from -1 to 5



(Total for Question 12 is 4 marks)

-
- ① at least five points plotted correctly (according to table filled in)
② for all points correct joined with a smooth curve.

10 (a) Expand $x(x+2)$

$$x^2 + 2x \quad (1)$$

(b) Expand and simplify $3(y+2) + 4(x-1)$

$$3y + 6 + 4x - 4$$

① if one bracket & expanded correctly

(c) Expand and simplify $(2t-3)(t+5)$

$$2t^2 + 10t - 3t - 15$$

① if at least 3 terms correct
or all 4 ignoring +

(d) Factorise fully $8a^2 + 12a$

$$\begin{aligned} \text{① for } 2a(4a+6) \text{ or } a(8a+12) \\ \text{or } 4a(2a+3) \quad (2) \end{aligned}$$

(Total for Question 10 is 7 marks)

(Total for Question 12 is 4 marks)

-
- ① at least five points plotted correctly (according to table filled in)
② for all points correct joined with a smooth curve.

- 15 Sue works for a company that delivers parcels.

One day the company delivered 80 parcels.
The table shows information about the weights, in kg, of these parcels.

Weight (w kg)	Frequency
$0 < w \leq 1$	19
$1 < w \leq 2$	17
$2 < w \leq 3$	15
$3 < w \leq 4$	12
$4 < w \leq 5$	10
$5 < w \leq 6$	7

- (a) Complete the cumulative frequency table.

Weight (w kg)	Cumulative Frequency
$0 < w \leq 1$	19
$0 < w \leq 2$	36
$0 < w \leq 3$	51
$0 < w \leq 4$	63
$0 < w \leq 5$	73
$0 < w \leq 6$	80

① all correct

(1)

- (b) On the grid opposite, draw a cumulative frequency graph for your table.

(2)

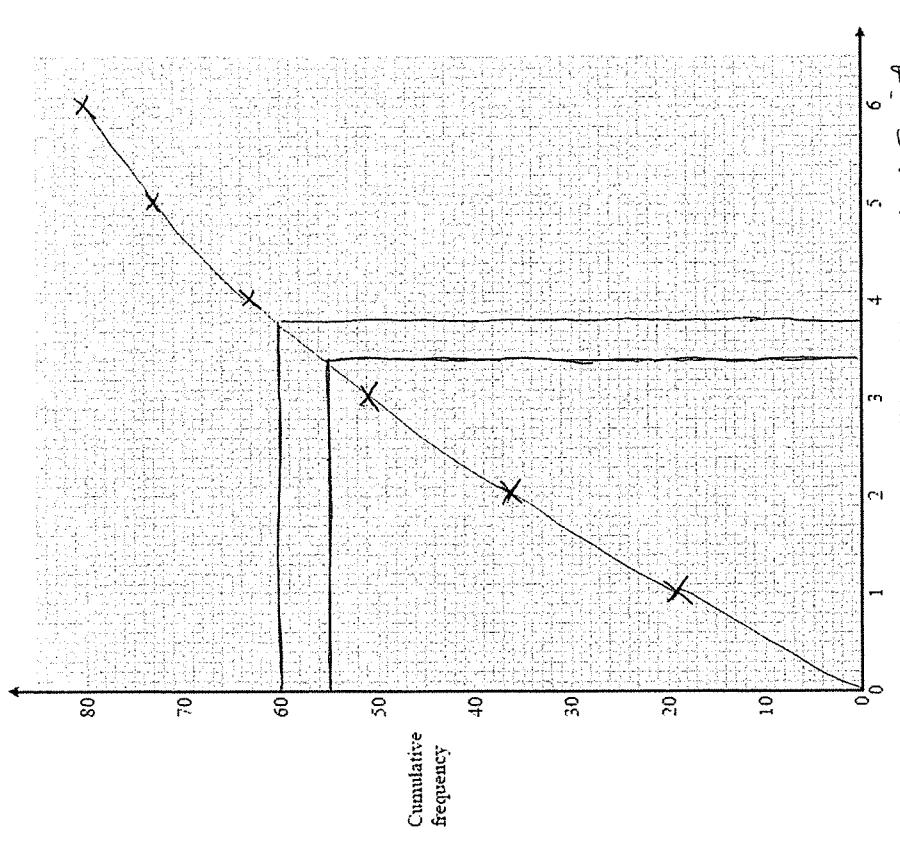
Sue says, "75 % of the parcels weigh less than 3.4 kg."

Sue says,

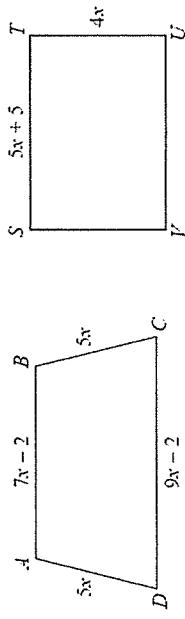
"75 % of the parcels weigh less than 3.4 kg."
① all correct
② not fully correct.
③ not correct.

- * (c) Is Sue correct?
You must show how you get your answer.

- ① for answer reading for 3.4 kg or 60 (75% of 80).
② for reading between 55-57 or 3.6-3.8.
③ for reading between 55-57 < 60, or 3.6-3.8 > 3.4.
④ not no, since 55-57 < 60, or 3.6-3.8 > 3.4.
(Total for Question 15 is 6 marks)



- 16 $ABCD$ is a trapezium.
 $STUV$ is a rectangle.



All measurements are in centimetres.

The two shapes have the same perimeter.

Work out the length of ST .

$$\text{Perimeter of rectangle} = 5x + 5 + 4x + 5x + 5 + 4x \quad ① \\ = 18x + 10$$

$$\begin{aligned} \text{Perimeter of trapezium} &= 9x - 2 + 5x + 7x - 2 + 5x \quad ① \\ &= 26x - 4 \end{aligned}$$

$$\text{Equate two perimeters: } "18x + 10" = "26x - 4" \quad ①$$

$$\begin{aligned} 8x &= 14 \\ x &= 1.75 \end{aligned} \quad ①$$

$$\begin{aligned} ST &= 5x + 5 = 5 \times 1.75 + 5 \\ &= 13.75 \text{ cm} \quad ① \end{aligned}$$

(Total for Question 16 is 5 marks)

- 18 Rationalise the denominator of $\frac{10}{\sqrt{5}}$
 Give your answer in its simplest form.

$$\frac{10\sqrt{5}}{\sqrt{5}} \quad ① = 2\sqrt{5} \quad ①$$

(Total for Question 18 is 2 marks)

PAST PAPER SET D (Nov 2015)

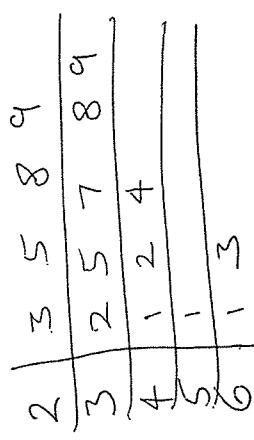
Diagram NOT
accurately drawn

1 Here are the lengths, in cm, of 15 tables.

28	51	42	23	63
38	44	29	32	37
61	35	39	41	25

Draw an ordered stem and leaf diagram for these lengths.

Key: $2|3 = 23$



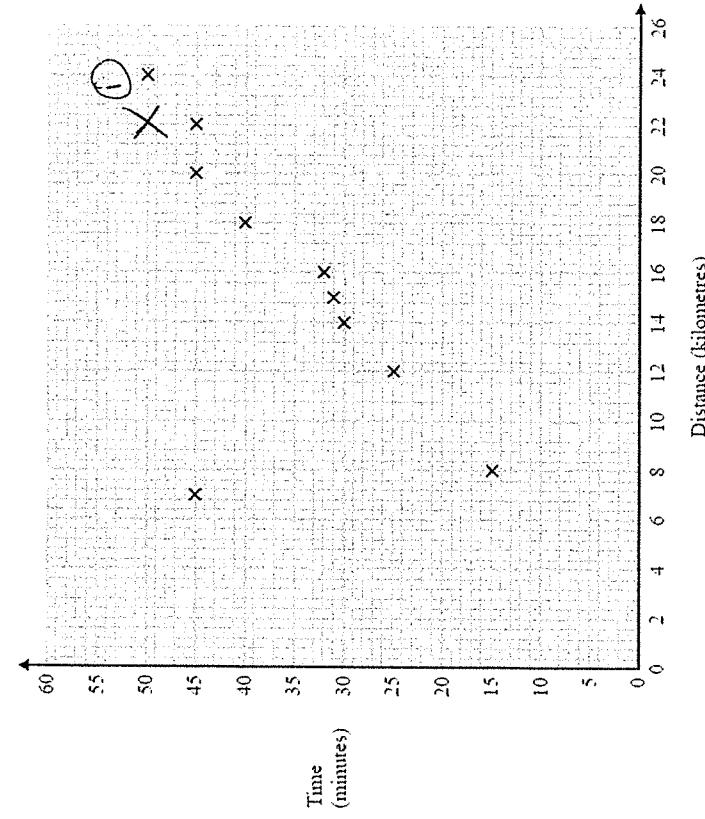
Key: $2|3 = 23$

- ① for correct key (any number)
- ② for fully correct ordered stem + leaf
- ③ if most one error
- ④ or fully correct but leaves not ordered

(Total for Question 1 is 3 marks)

- 2 A delivery driver records for each delivery the distance he drives and the time taken.

The scatter graph shows this information.



- The driver has to drive a distance of 10 km for his next delivery.

(c) Estimate the time taken for this delivery.

Answers between 18 and 22 ②

① for reasonable line of best fit minutes
② for correct line of range minutes

During one of the deliveries, the driver was delayed by road works.

(d) Using the graph write down the time taken for this delivery.

45

..... minutes

(1)
(Total for Question 2 is 5 marks)

3 Ali is y years old.

Bhavara is twice as old as Ali.
Ceris is 3 years younger than Ali.

The total of their ages is 125 years.

Work out the age of each person.

Ali y years old
Bhavara $2y$ years old
Ceris $y-3$ years old

$$\text{Sum of ages} = y + "2y" + "y-3" = 125 \quad ①$$

$$\begin{aligned} \text{① for correct} \\ \text{solution of linear equation formed} \\ 4y = 125 \\ 4y = 128 \end{aligned}$$

$$\begin{aligned} \text{Ali} &= 32 \\ \text{Bhavara} &= 64 \\ \text{Ceris} &= 29 \end{aligned}$$

Ali 32 years
Bhavara 64 years
Ceris 29 years

(1)
(Total for Question 3 is 4 marks)

For another delivery he drives 22 kilometres and takes 50 minutes.

(a) Show this information on the scatter graph.

(b) What type of correlation does the scatter graph show?

Positive ①
(1)

- 4 There are 18500 gallons of fuel in a fuel tank.
 The fuel is pumped from the fuel tank into a plane at a rate of 1700 litres per minute.
 $1 \text{ gallon} = 4.5 \text{ litres}$.
 How many minutes will it take to empty the fuel tank completely?
 Give your answer to the nearest minute.

$18500 \text{ gallons} = 18500 \times 4.5 \frac{\text{litres}}{\text{litres}}$

$= 83,250$

$1700 \div 4.5 \text{ gallons} \quad \textcircled{1}$

$= 377.8 \text{ gallons}$.

OR $1700 \text{ litres} = 1700 \div 4.5 \text{ gallons} \quad \textcircled{1}$

$= 377.8 \text{ gallons}$.

5 Celina and Zoe both sing in a band.
 One evening the band plays for 80 minutes.
 Celina sings for 65% of the 80 minutes.
 Zoe sings for $\frac{5}{8}$ of the 80 minutes.
 Celina sings for more minutes than Zoe sings.
 Work out for how many more minutes.
 You must show all your working.

$65\% \text{ of } 80 = 52$ (1)

$(0.65 \times 80) \text{ or } \frac{65}{100} \times 80$ or $10\% = 8, 60\% = 48, 5\% = 4, 65\% = 52$,

The fuel is pumped from the fuel tank into a plane at a rate of 1700 litres per minute.

$$18500 \text{ gallons} = 18500 \times 4.5 \frac{\text{litres}}{\text{gallons}}$$

How many minutes will it take to empty the fuel tank completely?
Give your answer to the nearest minute.

$$\begin{aligned} 18500 \text{ gallons} &= 18500 \times 4.5 \text{ litres} \\ &= 83,250 \text{ litres} \\ \text{OR } 1700 \text{ litres} &= 1700 \div 4.5 \text{ gallons} \\ &= 377.8 \text{ gallons.} \end{aligned} \quad \textcircled{1}$$

$$\begin{array}{l}
 \text{Number of minutes taken} \\
 = \frac{\text{"83,250"} \div 1700}{18,500 \div \text{"377.8"}}
 \end{array}$$

Total for Operation 1 is 3 minutes

ՀԱՅՈՒԹՅԱՆ ՊԵՏԱԿԱՆ ԳՐԱԴԱՐԱՆ

○
—
×
○ } -

卷之三

..... cm²

(Total for Question 5 is 4 marks)

○
—
×
○ } -

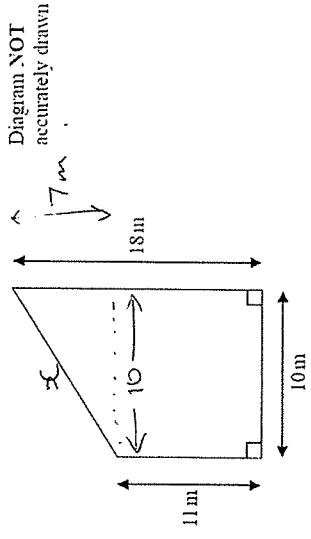
卷之三

..... cm²

November 2015 (Calculator) 99

November 2015 (Calculator)

- 7 Here is part of a field.



This part of the field is in the shape of a trapezium.
A farmer wants to put a fence all the way around the edge of this part of the field.

The farmer has 50 m of fence.

Does he have enough fence?
You must show all your working.

$$\text{Pythagoras Theorem} \quad \textcircled{1}$$

$$x^2 = 10^2 + 7^2 \quad \textcircled{1}$$

$$x = \sqrt{10^2 + 7^2}$$

$$\text{Perimeter} = 11 + 10 + 18 + \sqrt{10^2 + 7^2} \quad \textcircled{1}$$

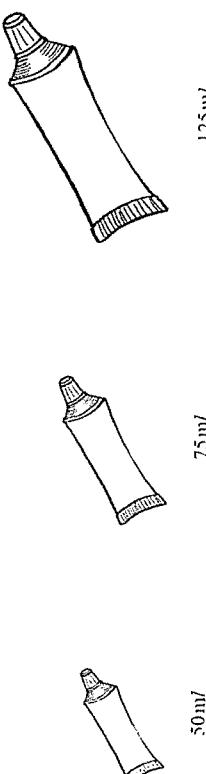
$$= 51.2 \text{ m} \quad \textcircled{1}$$

No, not enough.

$\textcircled{1}$ for correct conclusion based on Pythagoras Theorem used correctly -

(Total for Question 7 is 5 marks)

- *8 Toothpaste is sold in three different sizes of tube.



- A 50ml tube costs £1.09.
A 75ml tube costs £1.68.
A 125ml tube costs £2.69.

Which tube of toothpaste is the best value for money?
You must show all your working.

$$\begin{array}{lll} 50 \div 1.09 = 45.87 & \text{OR} & 50 \div 1.09 = 45.87 \\ 75 \div 1.68 = 44.64 & & 75 \div 1.68 = 44.64 \\ 125 \div 2.69 = 46.47 & & 125 \div 2.69 = 46.47 \\ 125 \text{ ml gives most} & & 125 \text{ ml gives most} \\ \text{per pound.} & & \text{per pound.} \end{array}$$

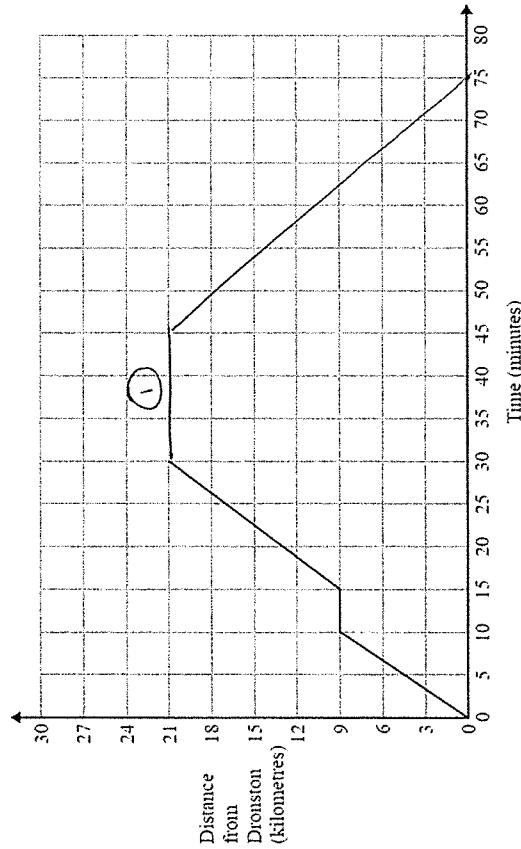
- $\textcircled{1}$ for at least 2 calculations from same column
 $\textcircled{1}$ for all 3 calculations from same column
 $\textcircled{1}$ for all 3 answers from same column
 $\textcircled{1}$ for correct to 3 sf
(Total for Question 8 is 4 marks)
- +
 $\textcircled{1}$ for correct conclusion based on correct 3 calculations from same column.

November 2015 (Calculator) 99

November 2015 (Calculator)

100

- 10 A coach travels from Dronston to Luscoe.
The travel graph for this journey is shown below.



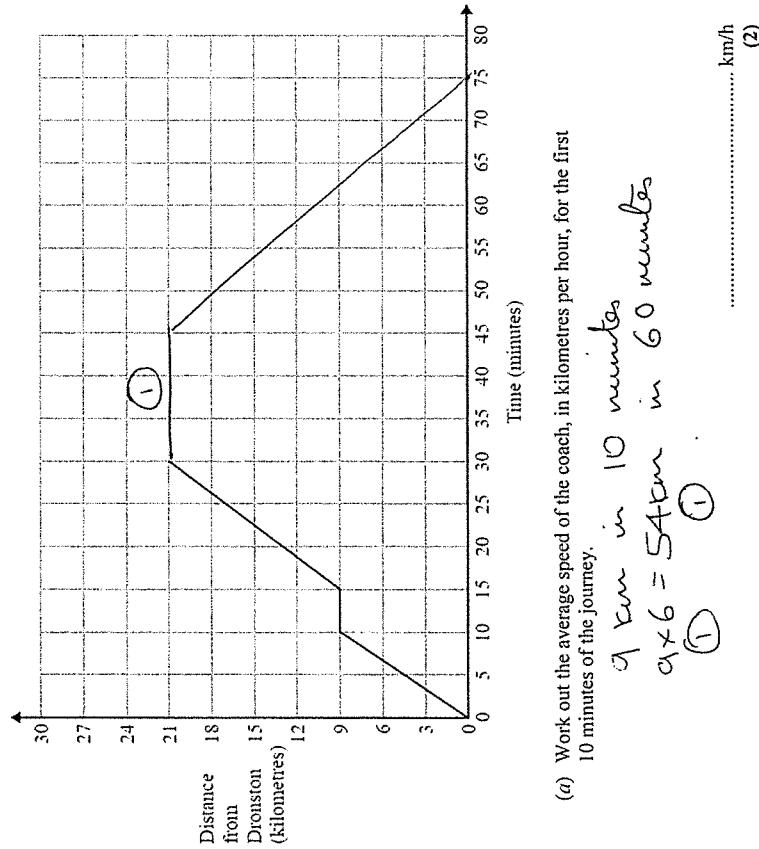
11 (a) Solve $3x^2 = 147$
 $\sqrt{3x^2} = \sqrt{147} \div \sqrt{3}$ (1)
 $x = \pm 7$ (1)

(b) Work out the value of 2^{-3}
 $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$ (1)

(c) Make p the subject of this formula.
 $4p = w + 16$ OR
 $p = \frac{w}{4} + 4$ (or $\frac{w+16}{4}$) (1)

(Total for Question 11 is 5 marks)

- 10 A coach travels from Dronston to Luscoe.
The travel graph for this journey is shown below.



The coach stops in Luscoe for 15 minutes.
The coach then returns to Dronston at a constant speed of 42 km/h.

- (b) Show this information on the travel graph.
(1) For line for 15 minute stop
42 km in 60 minutes
21 km in 30 minutes (1)
Gets back at 75 minutes (3)

(Total for Question 10 is 5 marks)

12

- 13 (a) Given that x and y are integers such that

$$3 < x < 7$$

$$4 < y < 9$$

$$\text{and } x+y=13$$

$$\begin{aligned}x &= 5 \quad \textcircled{1} \\y &= 8\end{aligned}$$

find all the possible values of x .

$$\begin{aligned}x &= 6 \quad \textcircled{1} \\y &= 7\end{aligned}$$

(2)

- (b) On the grid below show, by shading, the region defined by the inequalities

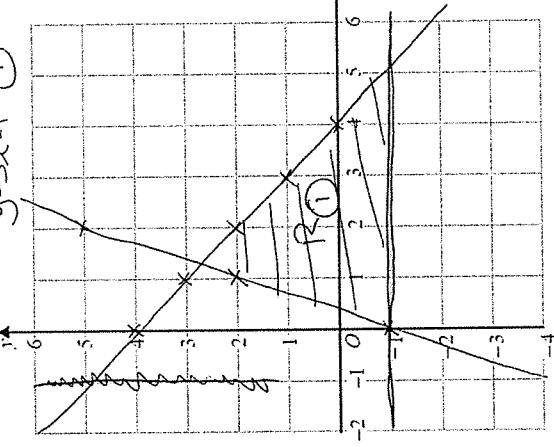
x	0	1	2	3
$y = 4 - x$	4	3	2	1
$y = 3x - 1$	-1	2	5	

$y \geq -1$ $y \leq 4 - x$ $y \leq 3x - 1$

Mark this region with the letter R.

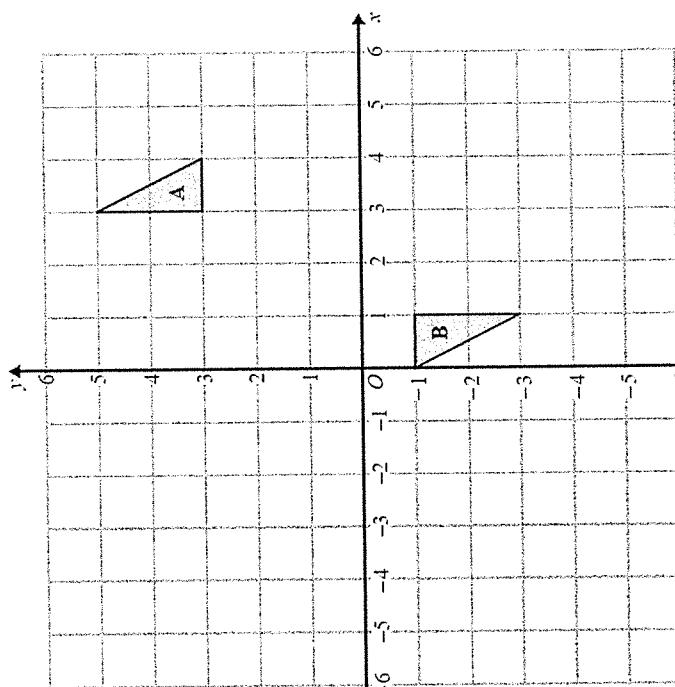
$$y = 3x - 1 \quad \textcircled{1}$$

$$y = 4 - x \quad \textcircled{1}$$



(4)

(Total for Question 13 is 6 marks)



Describe fully the single transformation that maps triangle A onto triangle B.

rotation $\textcircled{1}$

through 180° $\textcircled{1}$

centre of rotation $(2, 1)$ $\textcircled{1}$

(Total for Question 12 is 3 marks)

21 148 students went to Brighton.

Each student went to the Aquarium or the Brighton Wheel or the Royal Pavilion.

The table gives information about these students.

	Aquarium	Brighton Wheel	Royal Pavilion
Male	16	15	22
Female	36	35	24

Work out the number of students in the sample who are female and went to the Brighton Wheel.

$$\frac{35}{148} \times 40 = 9 \text{ or } 10$$

(Total for Question 21 is 2 marks)

25 Nomusa has 30 sweets.

She has

18 fruit sweets

7 aniseed sweets

5 mint sweets

Nomusa is going to take at random two sweets.

Work out the probability that the two sweets will not be the same type of sweet.

You must show all your working.

correct ans
1 | 29

7 | 29

5 | 29

18 | 30

7 | 30

5 | 29

18 | 29

6 | 29

5 | 29

18 | 29

7 | 29

4 | 29 .

1st sweet

2nd sweet

3rd sweet

4th sweet

5th sweet

6th sweet

7th sweet

8th sweet

9th sweet

10th sweet

11th sweet

12th sweet

13th sweet

14th sweet

15th sweet

16th sweet

17th sweet

18 | 29

7 | 29

5 | 29

18 | 29

6 | 29

5 | 29

(Total for Question 25 is 4 marks)

(1) ~~corr tree as above (negatives of probabilities)~~
~~Prob (different) = $\left(\frac{18}{30} \times \frac{7}{30}\right) + \left(\frac{18}{30} \times \frac{5}{30}\right) + \left(\frac{7}{30} \times \frac{5}{30}\right)$~~

(2) ~~max (2)
corr tree
answes~~

(1) if one brand correct
answes

Prob (different) = $\left(\frac{18}{30} \times \frac{7}{29} + \frac{18}{30} \times \frac{5}{29}\right) + \left(\frac{7}{30} \times \frac{18}{29} + \frac{7}{30} \times \frac{5}{29}\right)$

= $\frac{502}{870}$ (4) marks

105

PAST PAPER SET E (June 2016)

- 1 The diagram shows a prism.

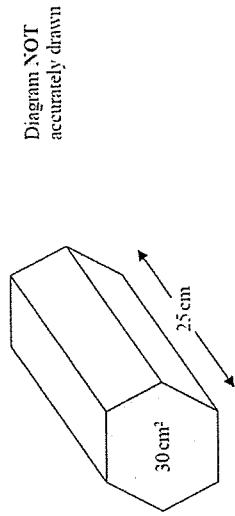


Diagram NOT
accurately drawn

The area of the cross section of the prism is 30 cm^2 .
The length of the prism is 25 cm.

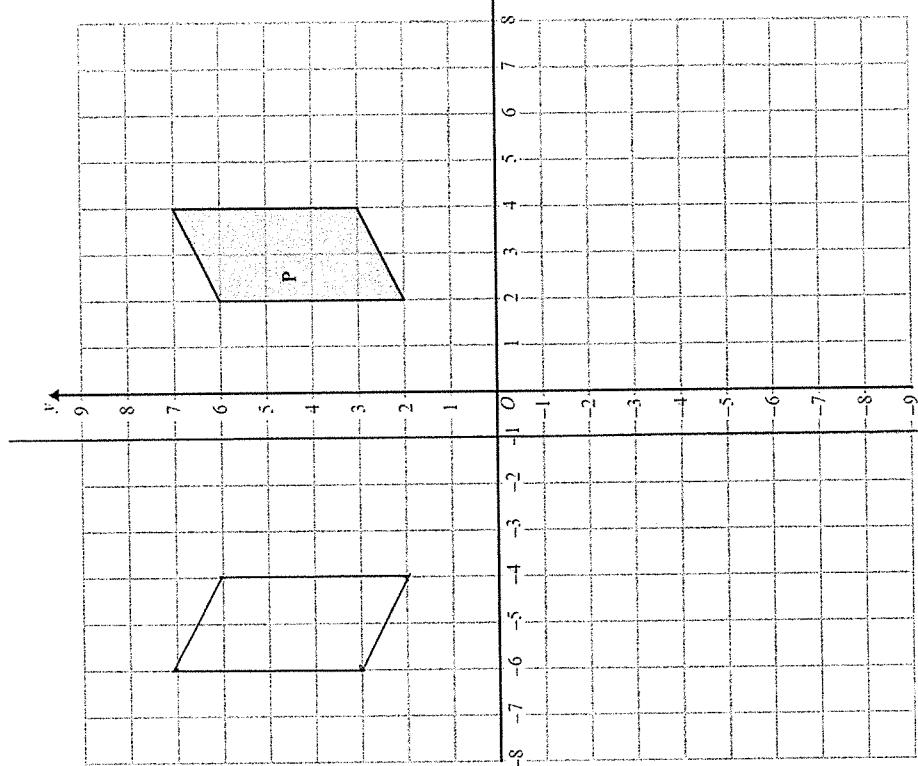
Work out the volume of the prism.

$$\textcircled{1} \quad 30 \times 25 = 750$$

$$\textcircled{1} \quad \begin{matrix} 3 \\ 750 \text{ cm}^3 \end{matrix}$$

(Total for Question 1 is 3 marks)

2

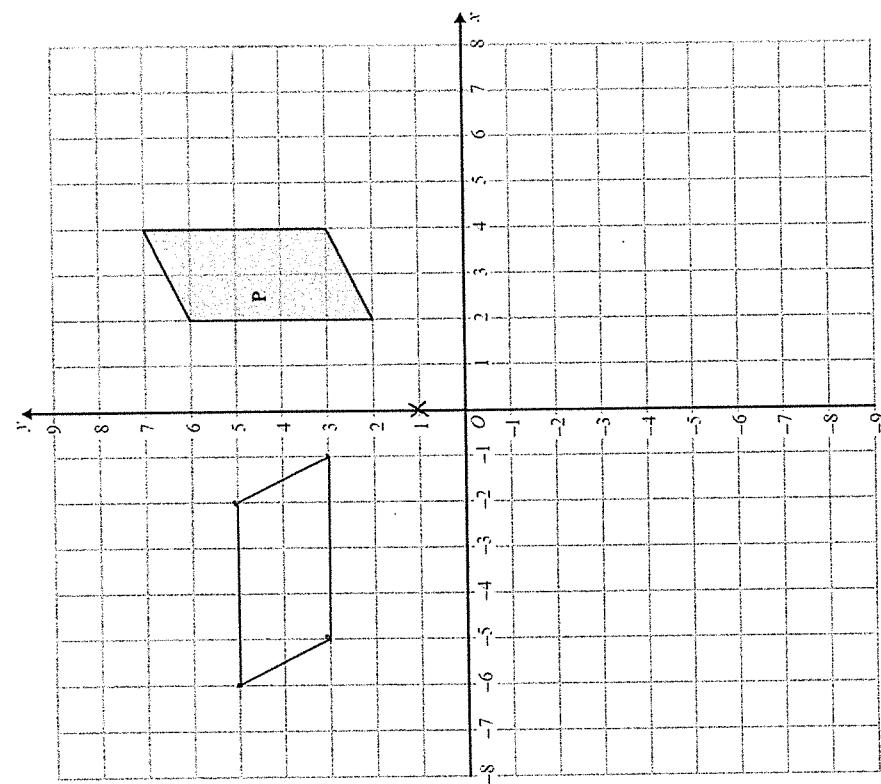


- (a) Reflect shape P in the line $x = -1$

(2)

106

106



- 3 Richard wants to find out how often people buy crisps.
He uses this question on a questionnaire.

How often do you buy crisps?

Often	<input type="checkbox"/>
Sometimes	<input type="checkbox"/>
Never	<input type="checkbox"/>

(a) Write down two things that are wrong with this question.

1 No time frame ①

Vague response boxes ①

2 Not exclusive eg "no always" ①

(b) Design a better question for Richard to use on his questionnaire to find out how often people buy crisps.

- ① Suitable question, which includes time frame

- ① At least 3 non-overlapping response boxes.

(2)

Richard is going to ask the students in his maths class to answer his questionnaire.

- (b) Rotate shape P 90° anticlockwise about (0, 1).
(Total for Question 2 is 4 marks)

- (c) This may not be a good sample to use.
Give one reason why.

Biased eg all the same age, ①
they are friends, too small a sample.

- NB Based alone
doesn't get the mark. (Total for Question 3 is 5 marks)

107

4 (a) Simplify $p^2 \times p^5$

$$p^7 \quad (1)$$

(b) Simplify $g^6 \div g^4$

$$g^2 \quad (1)$$

(c) Simplify $(k^3)^2$

$$k^6 \quad (1)$$

- 5 There are 892 litres of oil in Mr Aston's oil tank.
He uses 18.7 litres of oil each day.

Estimate the number of days it will take him to use all the oil in the tank.

① for 1000 or 900 or 20 or 18 or 19

① Answer between 44 - 56

(Total for Question 5 is 2 marks)

6 One of the teachers at a school is chosen at random.

The probability that this teacher is female is $\frac{3}{5}$

There are 36 male teachers at the school.

Work out the total number of teachers at the school.

$$\textcircled{1} \quad 1 - \frac{3}{5} = \frac{2}{5} \text{ or } 40\%$$

$$\textcircled{1} \quad 36 \div 2 = 18 \times 3 = 54$$

$$n(n-7) \quad (1)$$

(Total for Question 4 is 6 marks)

90

(Total for Question 6 is 3 marks)

JUNE 2016 (Non calculator)

107

107

4 (a) Simplify $p^2 \times p^5$

$$p^7 \quad (1)$$

(b) Simplify $g^6 \div g^4$

$$g^2 \quad (1)$$

(c) Simplify $(k^3)^2$

$$k^6 \quad (1)$$

(d) Expand and simplify $3(m+4) - 2(4m+1)$

$$\textcircled{1} \quad 3m+12 \text{ or } -8m-2 \text{ or } 8m+2$$

$$\textcircled{1} \quad -5m+10 \text{ or } 10-5m \text{ or } -5(m-2) \text{ or } 5(2-m)$$

(e) Factorise $n^2 - 7n$

$$n(n-7) \quad (1)$$

(Total for Question 4 is 6 marks)

90

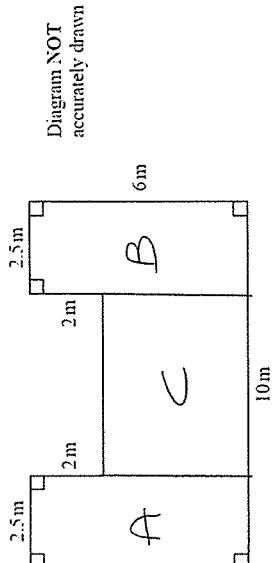
(Total for Question 6 is 3 marks)

JUNE 2016 (Non calculator)

107

108

- *7 The diagram shows the plan of a floor.



Angie is going to varnish the floor.

She needs 1 litre of varnish for 5 m^2 of floor.
There are 2.5 litres of varnish in each tin of varnish.

Angie has 3 tins of varnish.

Does she have enough varnish for all the floor?
You must show all your working.

$$\begin{aligned} A &= 2.5 \times 6 = 15 \quad \textcircled{1} \text{ for } 1 \text{ correct} \\ B &= 2.5 \times 6 = 15 \quad \textcircled{1} \\ C &= 5 \times 4 = \frac{20}{50 \text{ m}^2} \quad \textcircled{1} \\ 50 \div 5 &= 10 \text{ litres} \quad \textcircled{1} \\ 2.5 \times 3 &= 7.5 \text{ minutes} \quad \textcircled{1} \end{aligned}$$

No she doesn't have enough varnish

- 8 Carol spins a spinner 80 times.

The table shows information about her results.

Outcome	Frequency
J	39
K	25
L	16

Dan spins this spinner 300 times.

Work out an estimate for the number of times that Dan will get an L.

$$\textcircled{1} \frac{16}{80} \times 300$$

$$\begin{array}{r} \textcircled{1} \\ 60 \\ \hline \end{array}$$

(Total for Question 8 is 3 marks)

- 9 A shop sells packets of envelopes.

There are 5 envelopes in a small packet.
There are 20 envelopes in a large packet.

There is a total of T envelopes in x small packets and y large packets.

Write down a formula for T in terms of x and y.

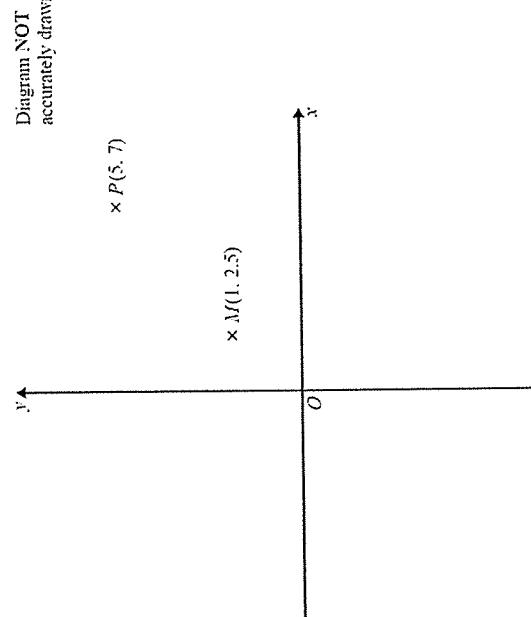
$$\textcircled{1} \quad \textcircled{1} \quad \textcircled{1} \\ T = 5x + 20y$$

(Total for Question 9 is 3 marks)

108

109

- 10
Diagram NOT accurately drawn
 x
 y
 $\times P(5, 7)$
 $\times M(1, 2.5)$



Point P has coordinates (5, 7).
Point M has coordinates (1, 2.5).

Point M is the midpoint of the line PQ.
Find the coordinates of point Q.

$$x = -3 \quad y = -2$$

($x = -3, y = -2$)
(Total for Question 10 is 2 marks)

11.....
(Total for Question 11 is 4 marks)

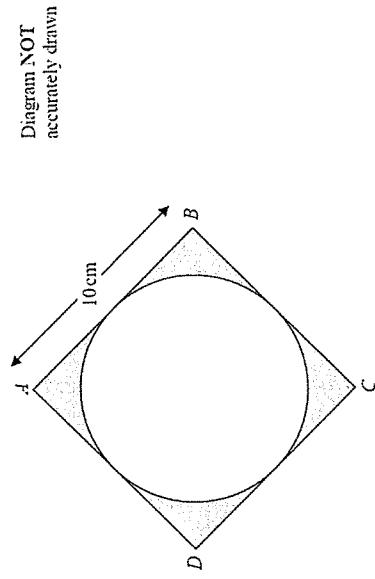
- 11
66 people went on a day trip.
Each person did only one activity on the trip.
Each person went skating or went to an art gallery or went bowling.
43 of the people are female.
4 of the 10 people who went skating are male.
20 of the people went to the art gallery.
10 males went bowling.

Work out the number of females who went to the art gallery.

	S	F	B	TOTAL
M	4	9	10	23
F	6	11	26	43
TOTAL	10	20	36	66

110

- 12 The diagram shows a circle inside a square.



$ABCD$ is a square of side 10 cm.
Each side of the square is a tangent to the circle.

Work out the total area of the shaded regions in terms of π .
Give your answer in its simplest form.

$$\textcircled{1} \quad \pi r^2 = \pi \times 5 \times 5 = 25\pi$$

$$\textcircled{1} \quad 10 \times 10 = 100 \text{ cm}^2$$

1

$$\textcircled{1} \quad \frac{36}{100} = 36\%$$

(Total for Question 13 is 3 marks)

JUNE 2016 (Non calculator) 110

- 13 The table gives information about Ali's spending last month.

Item	Percentage of total spending
rent	30%
food	15%
transport	12%
other	43%

Ali's total spending last month was £800

Next month Ali's rent, in pounds, is going to rise by 20%.
His total spending will still be the same.

Express the amount of money Ali will spend on rent next month as a percentage of £800

$$\begin{array}{l} 10\% \text{ of } 30\% = 3\% \\ 20\% \text{ of } 30\% = 6\% \end{array}$$

$$\begin{array}{l} 30\% + 6\% = 36\% \\ \textcircled{1} \end{array}$$

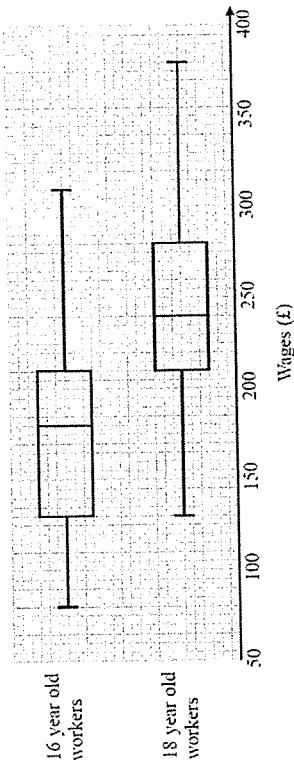
$$\textcircled{1} \quad 100 - 25\pi \text{ cm}^2$$

(Total for Question 12 is 3 marks)

JUNE 2016 (Non calculator) 110

111

- 15 The box plots give information about the wages of a group of 16 year old workers and a group of 18 year old workers.



(a) Compare the distribution of the wages of the 16 year old workers with the distribution of the wages of the 18 year old workers.

- ① Compare medians
 ② Compare IQRs or ranges
 ③ Comment written in context

There are 200 workers who are 16 years old.

(b) Work out an estimate for the number of these workers whose wages are £130 or more.

$$\frac{3}{4} \times 200$$

$$150$$

(Total for Question 15 is 5 marks)

111

- 17 (a) Solve $3x - 5 < 16$

$$\textcircled{1} \quad 3x < 21$$

$$(b) \text{ Solve } \frac{11-w}{4} = 1+w$$

$$\times 4 \quad \times 4$$

$$\begin{aligned} 11-w &= 4 + 4w \\ +w &\quad +w \\ 11 &= 4 + 5w \\ -4 &\quad -4 \\ 7 &= 5w \end{aligned}$$

(Total for Question 17 is 5 marks)

111

112

18 (a) Work out $1\frac{1}{5} \times 2\frac{1}{3}$

Give your answer as a mixed number in its simplest form.

$$\textcircled{1} \text{ for either } \frac{16}{5} \times \frac{7}{3} = \frac{42}{15} \quad \text{or} \quad \frac{7}{3} \times \frac{16}{5} = 2\frac{12}{15} = 2\frac{4}{5}$$

21 The probability that it will rain on a day in June is 0.2.

When it rains the probability that my tennis match is cancelled is 0.7.

When it does not rain, the probability that my tennis match is not cancelled is 0.95.

(a) Complete the probability tree diagram for this information.

$$\textcircled{1} \quad \begin{array}{c} 0.05 \quad 0.7 \\ \diagdown \quad \diagup \\ \text{match is} \\ \text{cancelled} \end{array}$$

$$\textcircled{1} \quad \begin{array}{c} 0.2 \\ \diagup \quad \diagdown \\ \text{rains} \quad \text{does not rain} \\ \text{.....} \end{array}$$

(3)

(b) Work out $2\frac{7}{15} - 1\frac{2}{3}$

$$\textcircled{1} \quad \frac{37}{15} - \frac{25}{15} = \frac{12}{15} = \frac{4}{5} \quad \textcircled{1}$$

$$\textcircled{1} \quad \begin{array}{c} 0.3 \quad 0.95 \\ \diagup \quad \diagdown \\ \text{match is} \\ \text{not} \\ \text{cancelled} \end{array}$$

(3)

(b) Work out the probability that, on a day in June, it does not rain and my tennis match is cancelled.

$$0.8 \times 0.05 = 0.04$$

$$\textcircled{1} \quad \frac{4}{5}$$

(3)

(Total for Question 18 is 6 marks)

$$\textcircled{1}$$

$$\textcircled{1}, \textcircled{1}, \dots$$

(Total for Question 21 is 5 marks)

113

PAST PAPER SET E (June 2016)

- 1 Chloe recorded the test marks of 20 students.

22	29	38	16	36	18	30	21	27	43
14	41	25	38	46	19	48	34	23	46

(a) Show this information in an ordered stem and leaf diagram.

16, 18, 14, 19
 22, 29, 21, 27, 25, 23
 38, 36, 30, 32, 38, 34
 43, 41, 46, 48, 46.

- 2 (a) Simplify $3a \times 5b \times 2c$

$$30abc \quad \dots \quad (1)$$

$$3(y+2) \quad \dots \quad (1)$$

(b) Factorise $3y + 6$

$$x^2 - 3x \quad \dots \quad (1)$$

(Total for Question 2 is 3 marks)

(b) Factorise $3y + 6$

(c) Expand $x(x - 3)$

$$x^2 - 3x \quad \dots \quad (1)$$

(Total for Question 2 is 3 marks)

113

- 2 (a) Simplify $3a \times 5b \times 2c$

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16, 18, 14, 19
 22, 29, 21, 27, 25, 23
 38, 36, 30, 32, 38, 34
 43, 41, 46, 48, 46.

①

①

Key $4/1 = 41$

1	4, 6, 8, 9
2	1, 2, 3, 5, 7, 9
3	0, 4, 6, 8, 8
4	1, 3, 6, 8

(3)

One of these students is going to be chosen at random.

- (b) Find the probability that this student has a test mark less than 28.

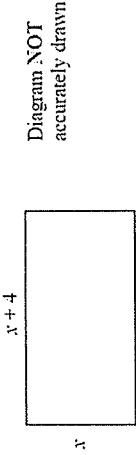
②

9
20

(Total for Question 1 is 5 marks)

114

- 3 The diagram shows a rectangle.



All measurements are given in centimetres.

The perimeter of the rectangle is 45 cm.

Work out the value of x .

$$x + 4 + x + 4 + x + x = 4x + 8$$

$$4x + 8 = 45 \quad (1)$$

$$-8 \qquad -8$$

$$4x = 37$$

$$37 \div 4 = 9.25 \quad (1)$$

9.25

$x = \dots$

(Total for Question 3 is 3 marks)

114

- *4 A shop sells bags of crisps in different size packs.

There are

- 18 bags of crisps in a small pack
- 20 bags of crisps in a medium pack
- 26 bags of crisps in a large pack

	Crisps	18 bags	f4 each pack	£4.00 each pack
	Crisps	20 bags	£4.99 each pack	£4.99 each pack
	Crisps	26 bags	£6.00 each pack	£6.00 each pack

Which size pack is the best value for money?

You must show all your working.

£4 pack	£4.99 pack	£6.00 pack
$\begin{array}{r} £4 \div 18 \\ = 0.22 \end{array}$	$\begin{array}{r} £4.99 \div 20 \\ = 0.24 \end{array}$	$\begin{array}{r} £6.00 \div 26 \\ = 0.23 \end{array}$

Medium pack is the best value.
①

(Total for Question 4 is 4 marks)

115

- 5 There are only blue counters, green counters, red counters and yellow counters in a bag. Olga is going to take at random a counter from the bag.

The table shows the probability that Olga will take a blue counter and the probability that she will take a yellow counter.

Colour	blue	green	red	yellow
Probability	0.4	0.09	0.36	0.15

The number of red counters in the bag is 4 times the number of green counters in the bag.

Complete the table.

$$1 - 0.4 - 0.15 = 0.45 \quad (1)$$

$$0.45 \div 9 = 0.09 \quad (1)$$

$$0.09 \times 4 = 0.36 \quad (1)$$

(Total for Question 5 is 3 marks)

- 6 The body mass index, B , for a person of mass m kg and height h metres is given by the formula

$$B = \frac{m}{h^2}$$

Usman has a mass of 50 kg.
He has a height of 1.57 m.

- (a) Work out Usman's body mass index.
Give your answer correct to one decimal place.

$$\textcircled{1} \quad \begin{array}{r} 50 \\ \hline 1,57^2 \\ \hline 20.3 \end{array} \quad = 20.3 \quad (1)$$

Tom's height is 1.80 m.
He wants his body mass index to be 21.

- (b) Work out the mass that will give Tom a body mass index of 21.

$$\begin{aligned} 21 &= \left\{ \begin{array}{l} \frac{m}{1.8^2} \\ \hline 3.24 \end{array} \right\} \textcircled{1} \\ 21 &= \frac{m}{3.24} \quad (1) \\ &\hline 68.04 & \textcircled{1} \\ &\hline 68.04 & \text{kg} \end{aligned}$$

Tom is a ski jumper.

The maximum length of skis he can use is 145% of his height.
Tom's height is 1.80 m.

- (c) Work out the maximum length of skis Tom can use.

$$145 \div 100 \times 1.80 = 2.61 \quad (1)$$

$$2.61 \quad \textcircled{1} \quad \dots \dots \text{m}$$

(Total for Question 6 is 7 marks)

116

7 The equation

$$x^3 - 5x = 34$$

has a solution between 3 and 4.

Use a trial and improvement method to find this solution.
Give your answer correct to 1 decimal place.
You must show all your working.

$$\begin{array}{r} x \\ \hline 3 \end{array} \quad \begin{array}{r} x^3 - 5x = 34 \\ 12 \end{array}$$

3.5	25.375
3.6	28.656
3.7	32.153
3.8	35.872
3.75	33.98
3.76	34.35
4	44

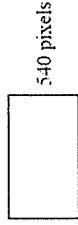
$$x = 3.8 \text{.....}$$

(Total for Question 7 is 4 marks)

116

8 Emma has a digital photo.

Diagram NOT
accurately drawn



The photo has a width of 720 pixels.
The photo has a height of 540 pixels.

- (a) Write down the ratio of the width of the photo to the height of the photo.
Give your ratio in its simplest form.

(1)

$$720 : 540 = 4 : 3$$

$$\begin{array}{r} 1 \\ 4 : 3 \end{array}$$

Emma wants the ratio of the width of the photo to the height of the photo to be 3 : 2.
She reduces the number of pixels in the height of the photo.
The width of the photo is still 720 pixels.

The ratio of the width of the photo to the new height of the photo is 3 : 2.

- (b) Work out the new height of the photo.

$$720 \div 3 = 240 \quad (1)$$

$$\begin{array}{r} 1 \\ 480 \end{array}$$

..... pixels
(2)

(Total for Question 8 is 4 marks)

JUNE 2016 (Calculator)

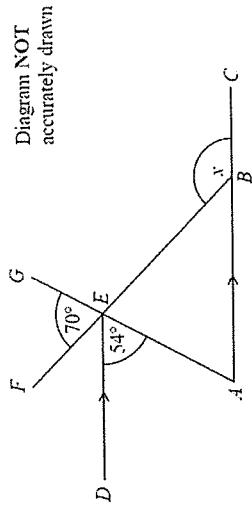
116

JUNE 2016 (Calculator)

110

117

*9



AB and DE are parallel lines.
 AEG and BEF are straight lines.

Angle $AED = 54^\circ$
Angle $FEG = 70^\circ$

Work out the size of the angle marked x .
Give a reason for each stage of your working.

$$\angle AEB = 70^\circ$$

$$\angle EAB = 54^\circ$$

Reasons
Corresponding angles
are equal.

Reasons
Alternate angles
are equal.

$$70 + 54 = 124^\circ$$

$$\angle ABE = 180 - 124 \underset{①}{=} 66^\circ.$$

$$180 - 66 = 124^\circ$$

$$\underset{①}{\text{①}} \quad x = 124^\circ$$

Reasons
Angles on a
straight line = 180° .

Angles in a
triangle = 180°

(Total for Question 9 is 4 marks)

117

10 The table gives information about the heights of 50 trees.

Height (h metres) \leq	Frequency	$= 16$	Any one of these
$0 < h \leq 4$	2	$\times 8$	$= 128$
$4 < h \leq 8$	6	$\times 21$	$= 126$
$8 < h \leq 12$	10	$\times 12$	$= 120$
$12 < h \leq 16$	14	$\times 7$	$= 98$
$16 < h \leq 20$	18	$\times 2$	$= 36$
			<u>396</u>

Work out an estimate for the mean height of the trees.

$$\text{Mean} = 396 \div 50 \underset{①}{=}$$

$$= 7.92 \underset{①}{=}$$

$$7.92 \underset{\substack{\dots \\ (\text{Total for Question 10 is 4 marks})}}{=}$$

JUNE 2016 (Calculator)

117

JUNE 2016 (Calculator)

117

118

- 11 Colin works on 5 days each week.
Each day he drives from his home to work and from work to his home.

Colin pays £3.50 each day to use the car park at work.

The distance from Colin's home to work is 18 miles.
Colin's car uses one gallon of petrol every 45.2 miles.

1 litre of petrol costs 136.9p
1 gallon = 4.546 litres

Work out the total cost for Colin to use his car for work each week.
You must show all your working.

$$\begin{aligned} 18 \times 2 \times 5 &= 180 && \left\{ \begin{array}{l} \textcircled{1} \text{ for} \\ \text{either} \\ \text{answer.} \end{array} \right. \\ 3.5 \times 5 &= 17.50 && \textcircled{1} \\ 180 \div 45.2 &= 3.9823 \text{ gallons} && \textcircled{1} \\ 3.9823 \times 4.546 &= 18.1 \text{ litres} && \textcircled{1} \end{aligned}$$

$$18.1 \times 136.9 = \text{£}24.78 \quad \textcircled{1}$$

$$\text{£}24.78 + \text{£}17.50 = \text{£}42.28 \quad \textcircled{1}$$

Any answer
between £42.26 and £42.30.

£.....

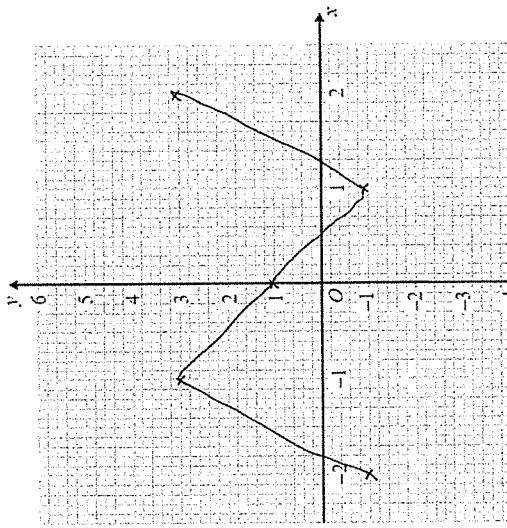
(Total for Question 11 is 5 marks)

118

- 13 (a) Complete the table of values for $y = x^3 - 3x + 1$

x	-2	-1	0	1	2
y	-1	3	(-)	1	3

- (b) On the grid, draw the graph of $y = x^3 - 3x + 1$ for values of x from -2 to 2.



- (2)
(Total for Question 13 is 4 marks)

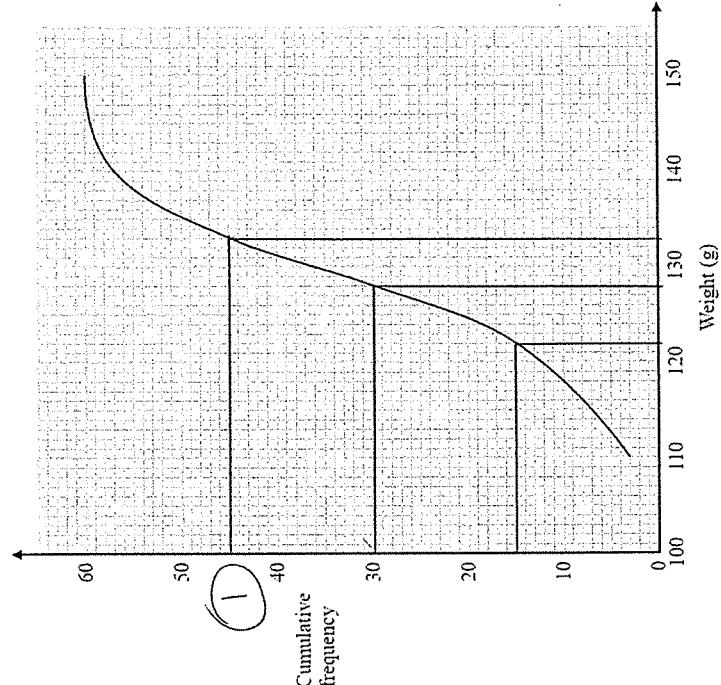
JUNE 2016 (Calculator)

JUNE 2016 (Calculator)

118

119

- 16 The cumulative frequency graph shows information about the weights of 60 apples.



- 18 (a) Simplify $2a^3b \times 5a^2b^3$

$$10a^{\underline{5}} b^{\underline{4}}$$

(2)

(Total for Question 18 is 2 marks)

- 19 The table gives information about 234 students in a school.

Year group	Number of female students	Number of male students
Year 12	77	51
Year 13	53	31
Year 14	13	9

Sadia is doing a survey of these students.
She is using a sample of 50 students stratified by year group and by gender.

Work out the number of Year 12 male students in the sample.

$$\begin{array}{r} 51 \\ 234 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ | \\ | \end{array}$$

(Total for Question 19 is 2 marks)

$$\begin{array}{r} 128.5 \\ \text{(1)} \end{array}$$

- (a) Use the graph to find an estimate for the median weight.

$$\begin{array}{r} 133 - 122 = 11 \\ \text{(1)} \end{array}$$

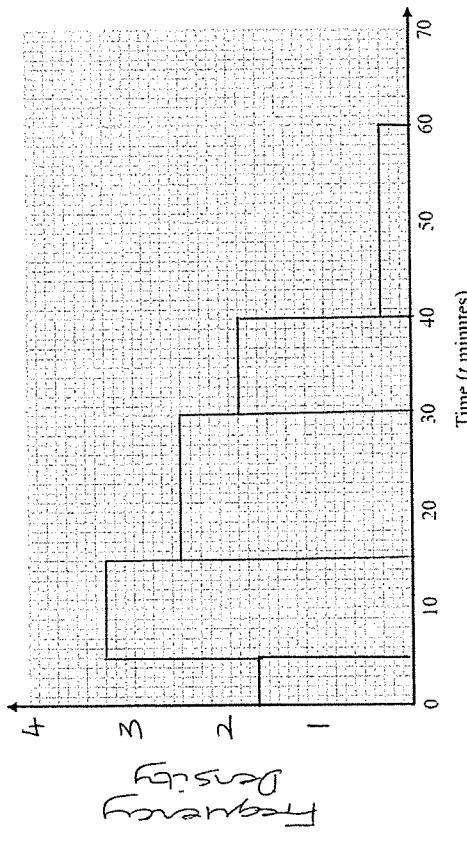
(Total for Question 16 is 3 marks)

120

- 23 The table gives information about the lengths of time some people were in a supermarket.

Time (t minutes)	Frequency
$0 < t \leq 5$	8
$5 < t \leq 15$	$32 \div 10 = 3,2$
$15 < t \leq 30$	$36 \div 15 = 2,4$
$30 < t \leq 40$	$18 \div 10 = 1,8$
$40 < t \leq 60$	$6 \div 20 = 0,3$

Draw a histogram for the information in the table.



(Total for Question 23 is 3 marks)
