BUMPER "BETWEEN PAPERS" PRACTICE PAPER

SET 3 (of 3)

HIGHER Tier (Summer 2017)

QUESTIONS

Not A "best" Guess paper.

Neither is it a "prediction" ... only the examiners know what is going to come up! Fact!
You also need to REMEMBER that just because a topic came up on paper 1 it may still come up on papers 2 or 3 ...

We know how important it is to practise, practise, practise .... so we've collated a load of questions that weren't examined in the Pearson/edexcel NEW 9-1 GCSE Maths paper 1 but we cannot guarantee how a topic will be examined in the next papers ...

Enjoy!

Mel & Seager

	Marks	Actual	😠 😐 😊
Q1. Fractions	3		
Q2. Circle theorems	4		
Q3. Recurring decimals	3		
Q4. Linear simultaneous equations	4		
Q5. Algebraic fractions	4		
Q6. Frequency polygons	2		
Q7. Stratified sampling	3		
Q8. Pie Charts	3		
Q9. Speed, distance and time	5		
Q10. Cumulative frequency	4		
Q11. Histograms	6		
Q12. Box Plots	5		
Q13. Enlargements	3		
Q14. Enlargements	2		
Q15. Rates of flow	6		
Q16. Distance time graphs	5		
Q17. Surds	4		
Q18. Compound interest	2		
Q19. Proportional reasoning	3		
Q20. Area in context	5		
Q21. Ratio	3		
Q22. Multiples in context	4		
Q23. Pythagoras/Trig	5		
Q24. Angle facts	4		
Q25. Interior Angles	4		
Q26. Angle facts	4		
Q27 Interior angles	3		
Q28. Simplifying	2		
Q29. Forming and solving	4		
Q30. Probability from a table	6		
Q31. Forming and solving	2		
Q32. Forming and solving	2		
Q33. Forming and solving	2		
Q34. Forming and solving	5		
Q35. Quadratic formula	3		
Q36. Constructions	4		
Q37. Constructions	2		
Q38. Scale drawing	3		
Q39. Scale drawing	2		

140

Q1 Work out $3\frac{1}{3} \times 4\frac{2}{5}$

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

....
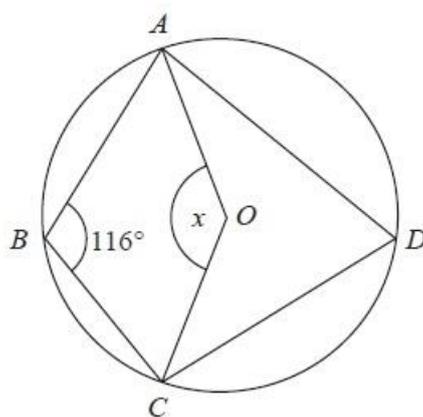
(Total for question = 3 marks)

Q2.

Diagram **NOT** accurately drawn

A, *B*, *C* and *D* are points on the circumference of a circle with centre *O*.

Angle *ABC* = 116°

Find the size of the angle marked *x*.

Give reasons for your answer.

(Total for Question is 4 marks)

Q3. Express the recurring decimal $0.28\dot{1}$ as a fraction in its simplest form.

(Total for Question is 3 marks)

Q4. Solve the simultaneous equations

$5x + 2y = -2$
$3x - 5y = 11.2$

$x = $ ....

$y = $ ....

(Total for question = 4 marks)

Q5. Solve $\dfrac{x+1}{2} + \dfrac{2x-1}{3} = \dfrac{5}{6}$

$x = $ ....

(Total for question = 4 marks)

Q6. The table shows information about the heights of 50 trees.

Height (*h* metres)	Frequency
$0 < h \leqslant 4$	8
$4 < h \leqslant 8$	21
$8 < h \leqslant 12$	12
$12 < h \leqslant 16$	7
$16 < h \leqslant 20$	2

Draw a frequency polygon for the information in the table.
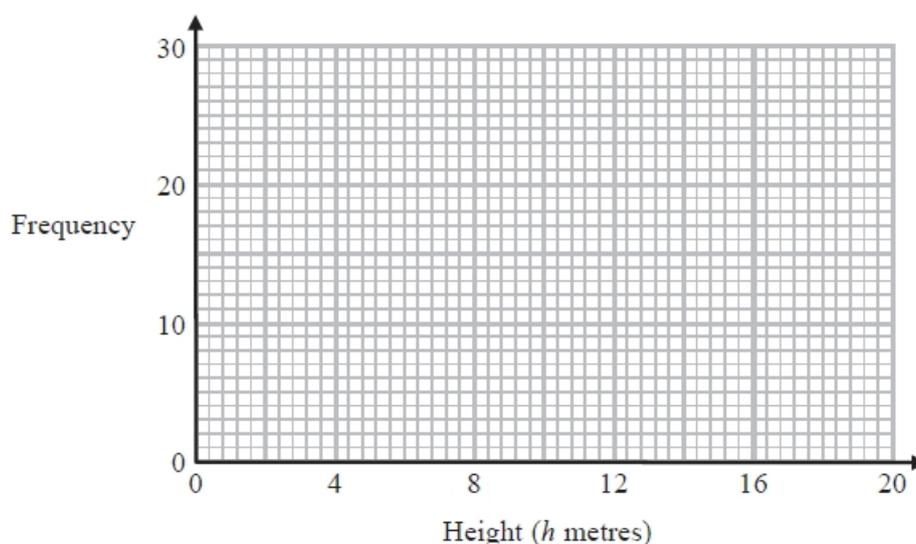
(Total for question = 2 marks)

Q7. Henri is carrying out a survey of the people aged 65 and over in his village.

The table shows information about these people.

Age	Male	Female
65 – 69	20	22
70 – 74	18	21
75 – 79	15	18
80 – 84	8	16
85 – 89	5	10
90+	2	5
Total	68	92

Henri is going to take a sample of 30 people stratified by age.

How many people aged 75 – 79 should be in the sample?

(Total for Question is 3 marks)
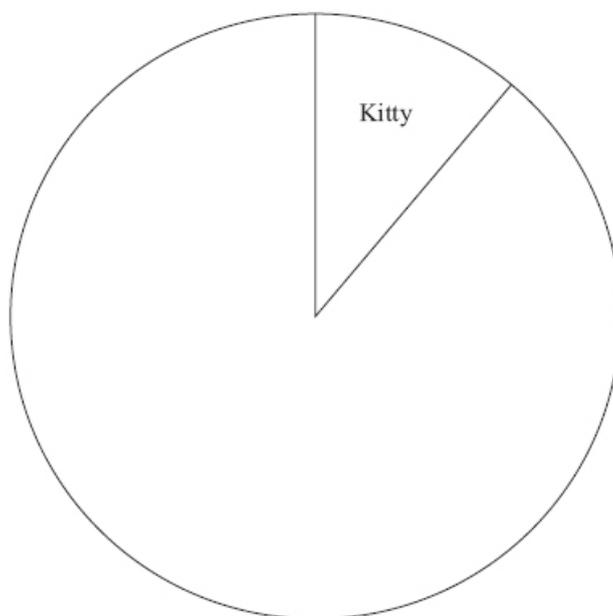
Q8 A survey was carried out for a magazine.

90 cat owners were asked to write down the make of cat food their cats liked best.

The bar chart shows information about the results.
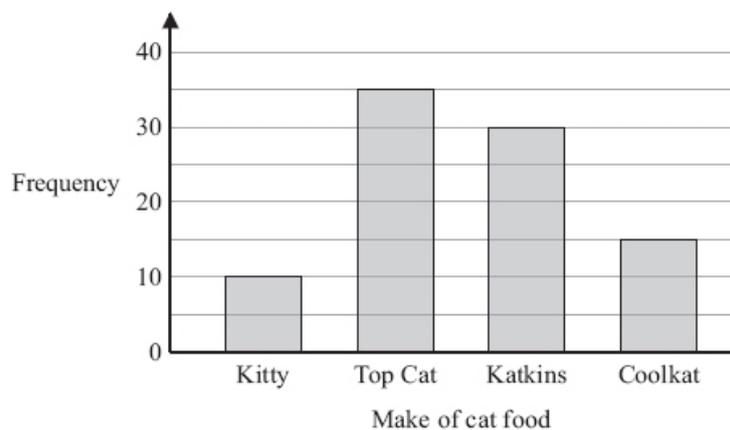
The information in the bar chart is going to be shown in a pie chart.

Use the information in the bar chart to complete the pie chart.

(Total for Question is 3 marks)

Q9 A road is 4530 m long, correct to the nearest 10 metres.

Kirsty drove along the road in 205 seconds, correct to the nearest 5 seconds.

The average speed limit for the road is 80 km/h.

Could Kirsty's average speed have been greater than 80 km/h?
You must show your working.

(Total for question = 5 marks)

Q10 The table shows information about the lengths, in seconds, of 40 TV adverts.

Time (T seconds)	Frequency
$10 < T \le 20$	4
$20 < T \le 30$	7
$30 < T \le 40$	13
$40 < T \le 50$	12
$50 < T \le 60$	4

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

(b)

Time (T seconds)	Cumulative frequency
$10 < T \le 20$	4
$10 < T \le 30$	
$10 < T \le 40$	
$10 < T \le 50$	
$10 < T \le 60$	

(1)

(b) On the grid, draw a cumulative frequency graph for your table.
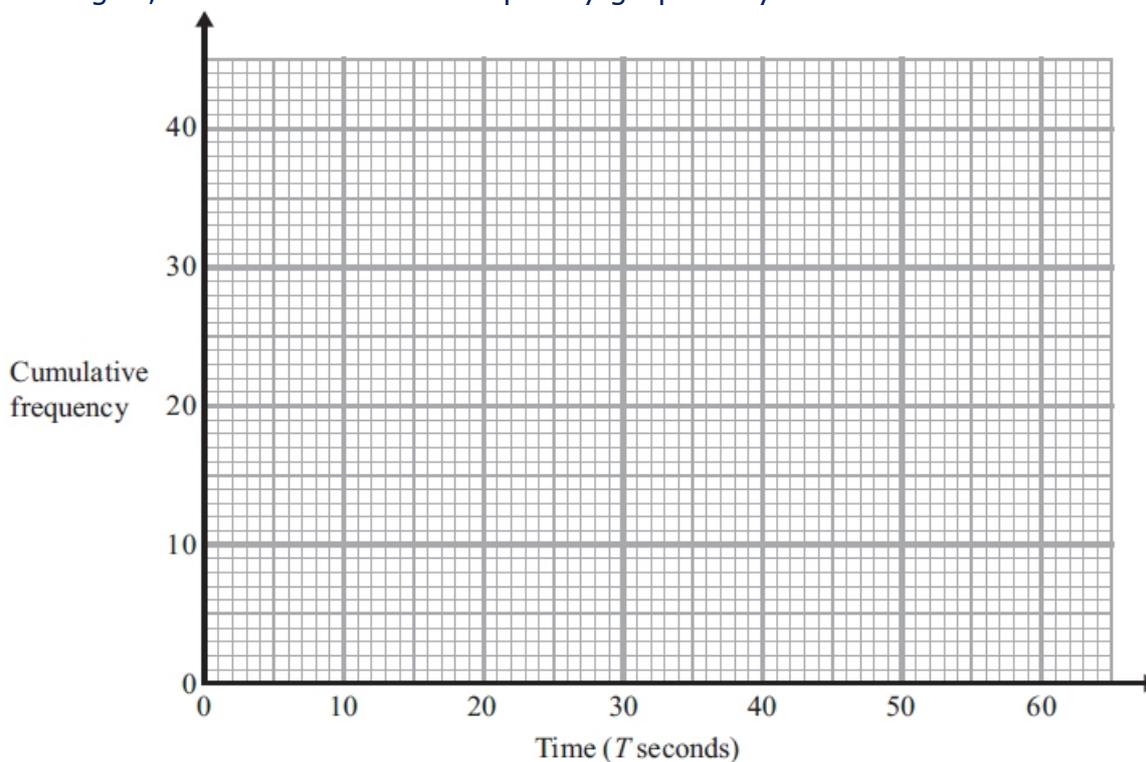
(2)

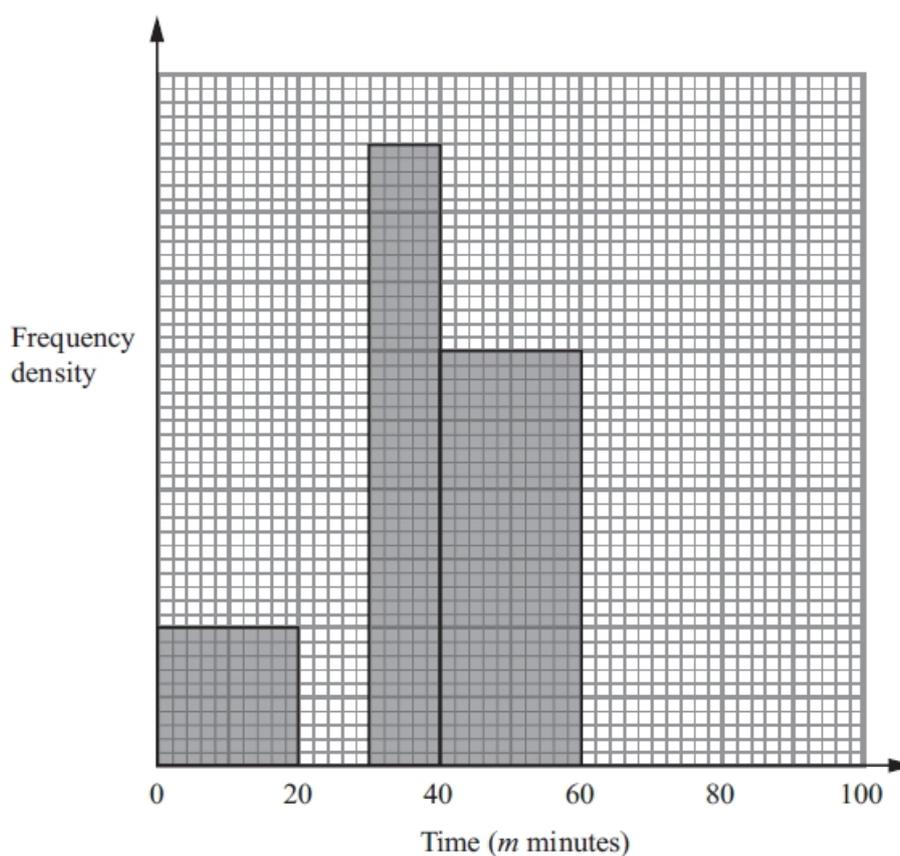(c) Use your graph to find an estimate for the median length of these TV adverts.

. . . . seconds

(1)

(Total for Question is 4 marks)

Q11. The table and the histogram show some information about the time, in minutes, taken by a group of students to travel to college in one week.

| Time (m minutes)	Frequency
$0 < m \leqslant 20$	20
$20 < m \leqslant 30$	30
$30 < m \leqslant 40$	
$40 < m \leqslant 60$	
$60 < m \leqslant 100$	48

(a)   Use the histogram to complete the table.

(2)

(b)   Use the table to complete the histogram.

(2)

(c)   Work out an estimate for the median time.

.... minutes **(2)**

(Total for Question is 6 marks)

Here are the ages, in years, of 15 women at West Ribble Tennis Club.
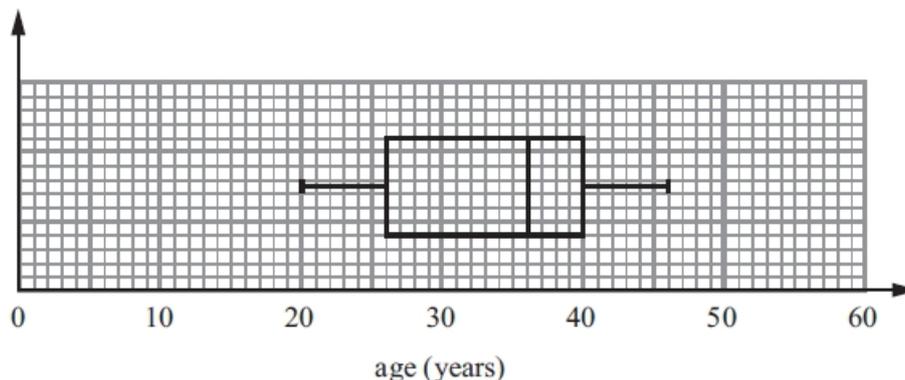
16,   18,   18,   20,   25,   25,   27,   28,   30,   35,   38,   42,   45,   46,   50

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

age (years)
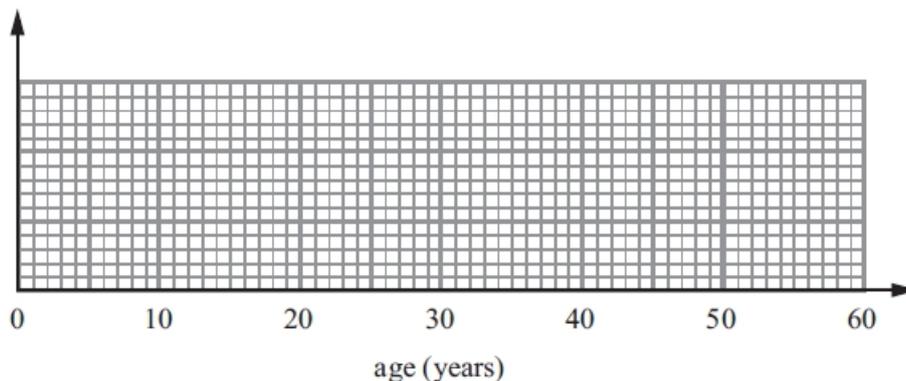
(3)

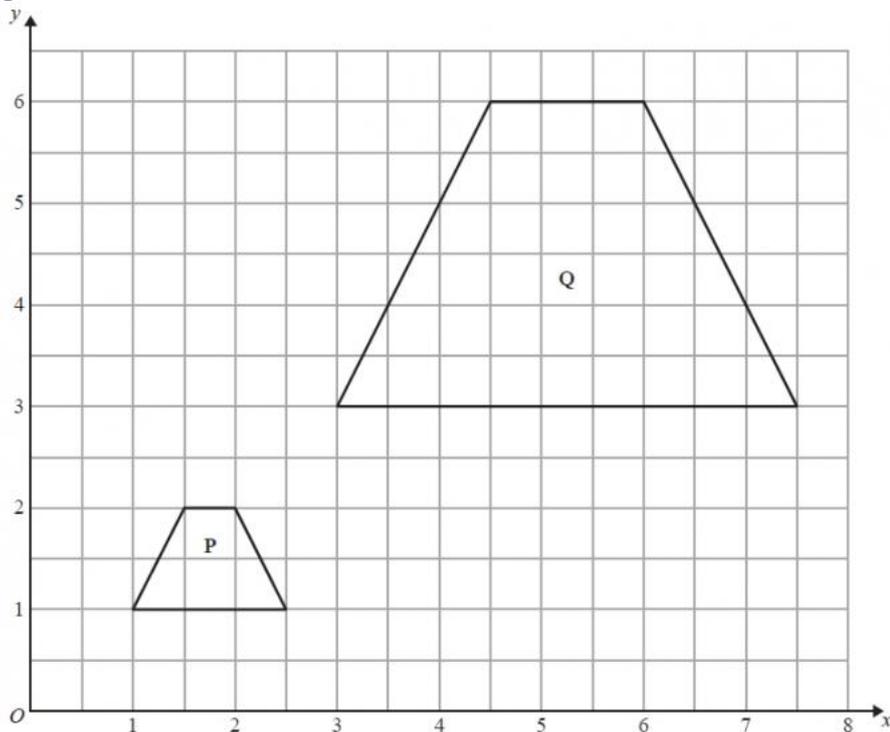The box plot below shows the distribution of the ages of the men at West Ribble Tennis Club.

age (years)

(b)   Use the box plots to compare the distributions of the ages of these women and the distributions of the ages of these men.
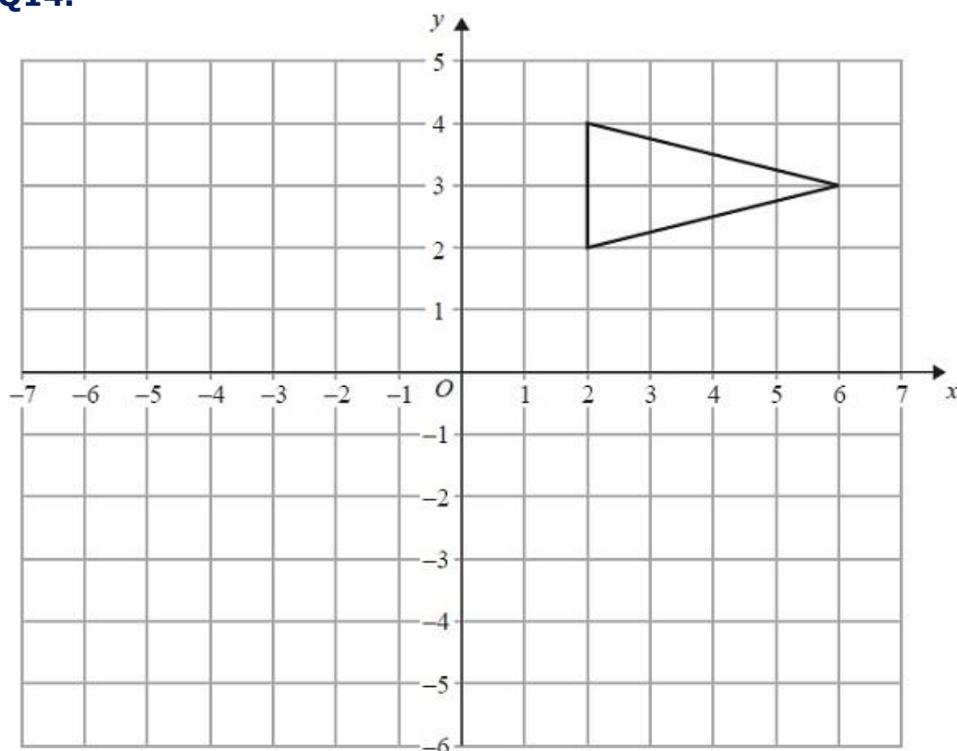
(2)

(Total for Question is 5 marks)

Describe fully the single transformation that maps shape **P** onto shape **Q**.

(Total for Question is 3 marks)

Q14.

On the grid, enlarge the triangle by scale factor $-\dfrac{1}{2}$, centre (0, −2).

(Total for Question is 2 marks)

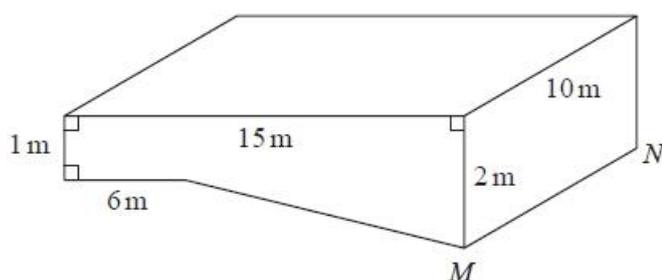**Q15.** The diagram shows a swimming pool in the shape of a prism.

Diagram **NOT**
accurately drawn
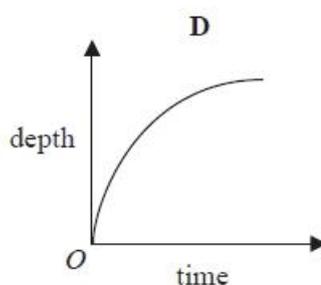
10 m

1 m   15 m

6 m   2 m   N

M
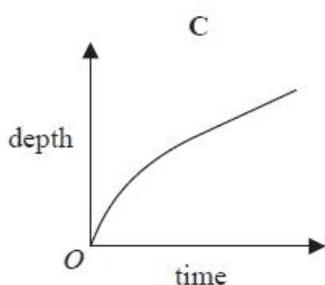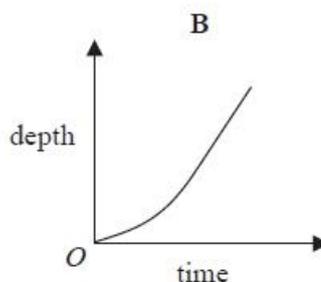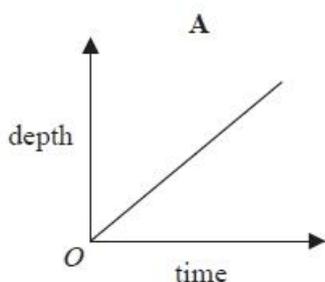
The swimming pool is empty.

The swimming pool is filled with water at a constant rate of 50 litres per minute.

(a) Work out how long it will take for the swimming pool to be completely full of water.
Give your answer in hours.
(1 m³ = 1000 litres)

.... hours **(5)**

Here are four graphs.

A

depth

O   time

B

depth

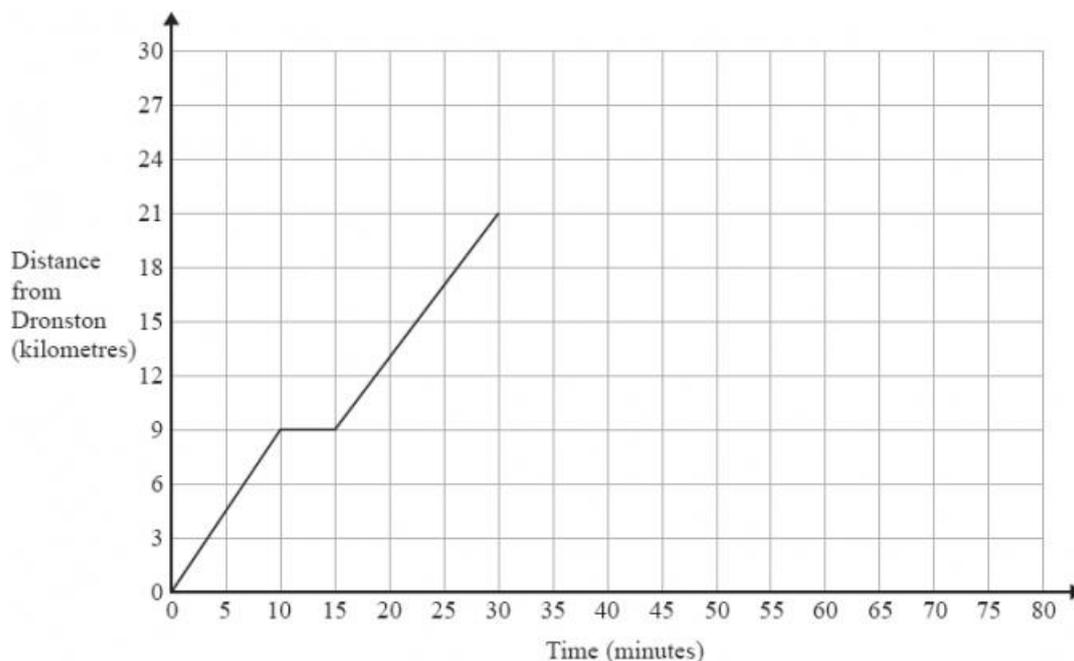O   time

C

depth

O   time

D

depth

O   time

(b) Write down the letter of the graph that best shows how the depth of the water in the pool above the line *MN* changes with time as the pool is filled.

....(1)

(Total for question = 6 marks)

Q16. A coach travels from Dronston to Luscoe.

The travel graph for this journey is shown below.

(a) Work out the average speed of the coach, in kilometres per hour, for the first 10 minutes of the journey.

.... km/h

(2)

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

(b) Show this information on the travel graph.

(3)

(Total for question = 5 marks)

Q17. (a) Express $5\sqrt{27}$ in the form $n\sqrt{3}$, where *n* is a positive integer.

(2)

(b) Rationalise the denominator of $\dfrac{21}{\sqrt{3}}$

.

(2)

Total for Question is 4 marks)

Q18. Danielle invested £2800 for n years in a savings account.

She was paid 2.5% per annum compound interest.
The interest is paid into the account at the end of each year.

At the end of n years, the amount of money in the savings account is greater than £3000 for the first time.

Work out the value of n.

....

(Total for question = 2 marks)

Q19. Harry has a cable.

The cable has a length of 16 metres.

Harry cuts the cable into two parts, part A and part B.

The length of part A is 5 metres.
The weight of part A is 8 kg.

Work out the weight of part B.

....kg

(Total for question = 3 marks)

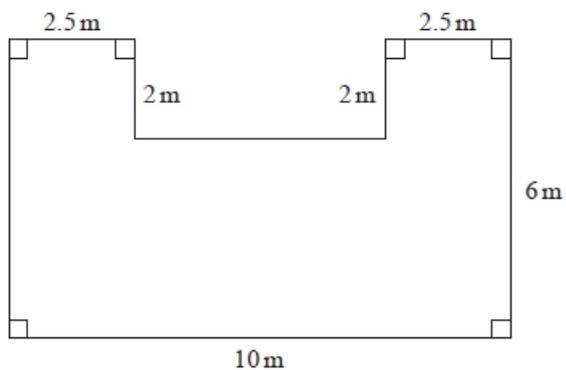**Q20.** The diagram shows the plan of a floor.

Diagram **NOT** accurately drawn

Angie is going to varnish the floor.

She needs 1 litre of varnish for 5 m² 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.

(Total for question = 5 marks)

Q21. Build-a-mix makes concrete.

    1 cubic metre of concrete has a weight of 2400 kg.

    15% of the concrete is water.

The rest of the ingredients of concrete are cement, sand and stone.
The weights of these ingredients are in the ratio 1 : 2 : 5

(a) Work out the weight of cement, of sand and of stone in 1 cubic metre of concrete.

(4)

Build-a-mix needs to make 30 cubic metres of concrete.
Build-a-mix has only got 6.5 tonnes of cement.

(b) Will this be enough cement for Build-a-mix to make 30 cubic metres of concrete?
You must show all of your working.

(3)
(Total for Question is 7 marks)

Q22 Shelley sells books.

On Saturday she is going to give a free book mark and a free dust cover with each book she sells.
All the books are the same size.

Shelley needs to buy the book marks and the dust covers.

Book marks come in boxes. Each box contains 24 book marks.

Dust covers come in packs. Each pack contains 36 dust covers.

Shelley wants to have enough book marks and dust covers for 250 books.
She buys exactly the same number of book marks and dust covers.

Work out the number of boxes of book marks and the number of packs of dust covers she buys.
You must show all your working.

.... boxes of book marks

.... packs of dust covers

(Total for question = 4 marks)
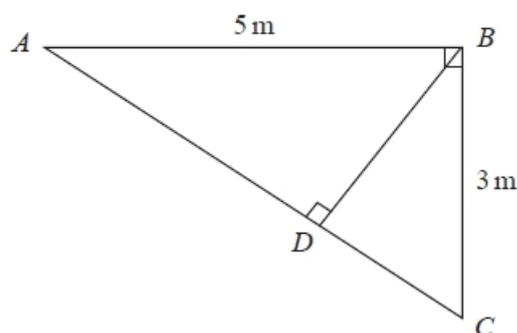
The frame is made from four metal bars, *AB*, *AC*, *BC* and *BD*.

Angle *ABC* = angle *ADB* = 90°
AB = 5 m
BC = 3 m

Work out the total length of the four metal bars of the frame. Give your answer correct to 3 significant figures.

.... m
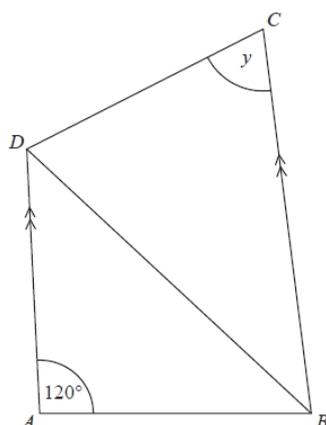
(Total for question = 5 marks)

Q24

BCD and *ABD* are isosceles triangles.
AB = *AD*
BC = *BD*

AD is parallel to *BC*.

Work out the size of angle *y*.
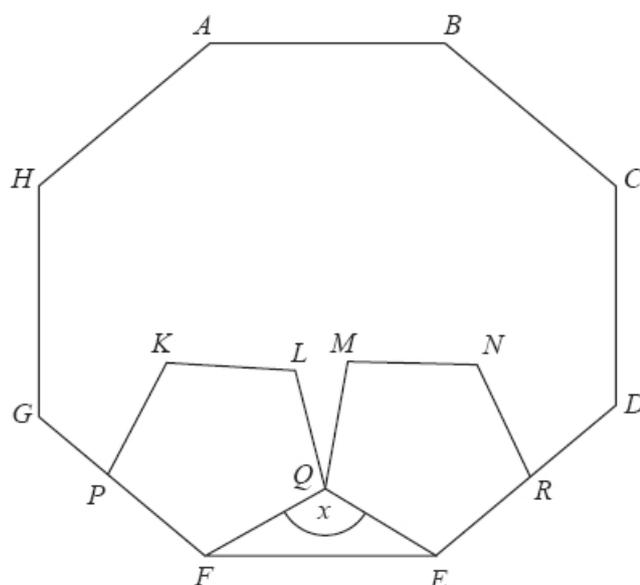You must give reasons for your answer.

(Total for question = 4 marks)

Diagram **NOT** accurately drawn

ABCDEFGH is a regular octagon.
KLQFP and *MNREQ* are two identical regular pentagons.

Work out the size of the angle marked *x*.
You must show all your working.

....°
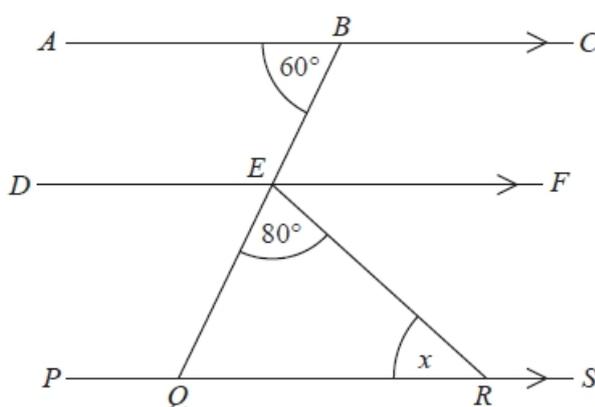
(Total for question = 4 marks)

Q26.

Diagram **NOT** accurately drawn

ABC, *DEF* and *PQRS* are parallel lines.
BEQ is a straight line.

Angle *ABE* = 60° Angle *QER* = 80°

Work out the size of the angle marked *x*. Give reasons for each stage of your working.
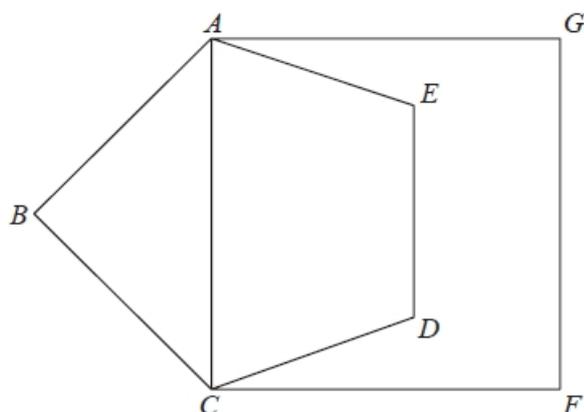
(Total for question = 4 marks)

Diagram **NOT**
accurately drawn

ABCDE is a regular pentagon.
ACFG is a square.

Work out the size of angle *DCF*.
You must show all your working.

....°

(Total for question = 4 marks)

Q28. (a) Simplify $5^4 \times 5^6$

.... **(1)**

(b) Simplify $7^5 \div 7^2$

....**(1)**

(Total for Question is 2 marks)
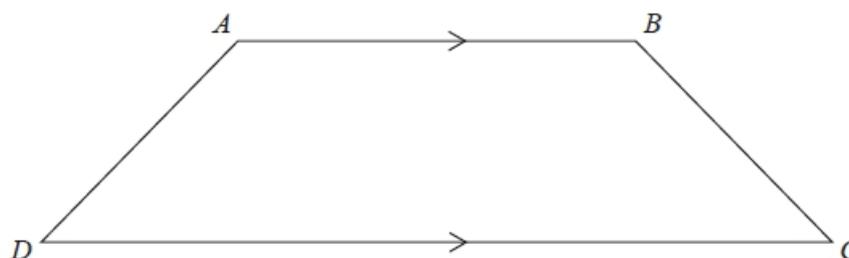
Q29 The diagram shows a trapezium.

Diagram **NOT** accurately drawn

$AD = x$ 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.

....cm

(Total for Question is 4 marks)

Q30. Mary plays a game of throwing a ball at a target.

The table shows information about the probability of each possible score.

Score	0	1	2	3	4	6
Probability	0.09	x	$3x$	0.16	0.21	0.30

Mary is 3 times as likely to score 2 points than to score 1 point.

(a) Work out the value of x.

(3)

Mary plays the game twice.

(b) Work out the probability of Mary scoring a total of 8

(3)

(Total for Question is 6 marks)

Q31. Dan, Harry and Regan sell cars.

Dan sells x cars.
Harry sells 5 more cars than Dan.
Regan sells twice as many cars as Dan.

Write an expression, in terms of x, for the mean number of cars Dan, Harry and Regan sell.

Total for question = 2 marks)

Q32.

Julie is x years old.
Kevin is $x + 3$ years old.
Omar is $2x$ years old.

Write an expression, in terms of x, for the mean of their ages.

(Total for Question is 2 marks)

Q33.

5 female giraffes have a mean weight of x kg.
7 male giraffes have a mean weight of y kg.

Write down an expression, in terms of x and y, for the mean weight of all 12 giraffes.
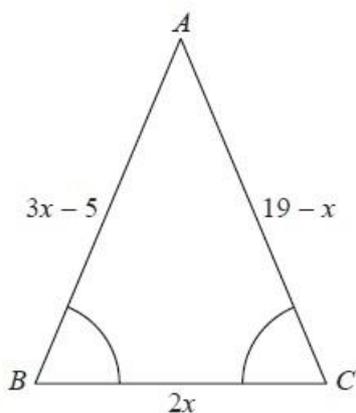
(Total for Question is 2 marks)

Q34. *ABC* is a triangle.

Diagram **NOT** accurately drawn

Angle *ABC* = angle *BCA*.

The length of side *AB* is (3*x* − 5) cm.

The length of side *AC* is (19 − *x*) cm.

The length of side *BC* is 2*x* cm.

Work out the perimeter of the triangle.

Give your answer as a number of centimetres.

.... cm

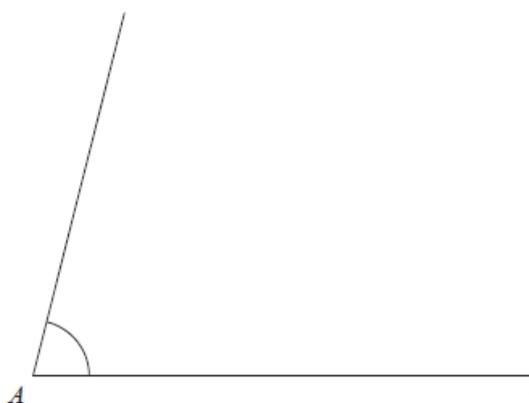**(Total for Question is 5 marks)**

Q35. Solve $3x^2 + 6x − 2 = 0$

Give your solutions correct to 2 decimal places.

(Total for question = 3 marks)

Q36 (a) Use ruler and compasses to bisect the angle at *A*.

You must show all your construction lines.

(2)

(b) Use ruler and compasses to construct the perpendicular from the point *P* to the line *QR*.

You must show all your construction lines.

(2)

(Total for question = 4 marks)

A ———————————————————— B

Use ruler and compasses to **construct** the perpendicular bisector of the line segment *AB*.
You must show all your construction lines.

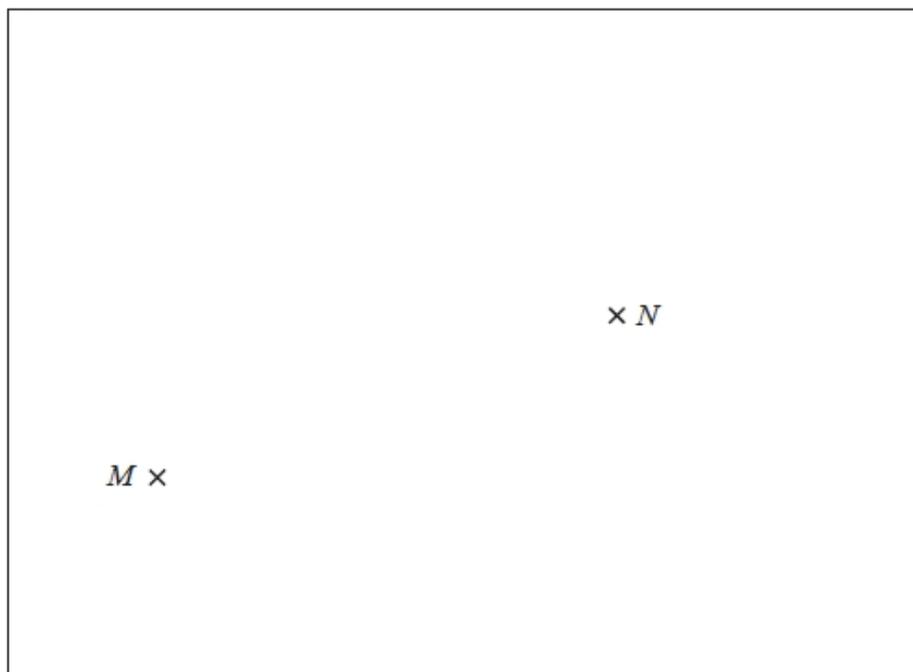**(Total for question = 2 marks)**

Q38 Here is a map.

The map shows two towns Marlford (*M*) and Newborough (*N*).

A company is going to build a supermarket.
The supermarket will be more than 10 km from Marlford and less than 6 km from Newborough.

Find and shade the region on the map where the company can build the supermarket.

× *N*

M ×

Scale: 1 cm represents 2 km.

(Total for question = 3 marks)

oak tree ✕

Scale: 1 cm represents 1 m

Gilda is going to plant an elm tree in the garden.

She must plant the elm tree at least 4 metres from the oak tree.

On the diagram, show by shading the region where Gilda can plant the elm tree.

(Total for Question is 2 marks)