JustMaths

BUMPER "BETWEEN PAPERS" PRACTICE PAPER

SET 2 (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	**3**		
Q3. Recurring decimals	**3**		
Q4. Linear simultaneous equations	**4**		
Q5. Algebraic fractions	**3**		
Q6. Frequency polygons	**2**		
Q7. Stratified sampling	**2**		
Q8. Pie Charts	**5**		
Q9. Speed, distance and time	**3**		
Q10. Cumulative frequency	**5**		
Q11. Reflections and translations	**4**		
Q12. Conversion graphs	**3**		
Q13. Trig graphs	**5**		
Q14. Box plots	**4**		
Q15. Factorise and expand	**6**		
Q16. Cubic graphs	**4**		
Q17. Bounds	**3**		
Q18. Proportional reasoning	**2**		
Q19. Depreciation	**3**		
Q20. Profit / compound interest	**6**		
Q21. Surds	**3**		
Q22. Area in context	**4**		
Q23. Ratio	**2**		
Q24. Multiples in context	**4**		
Q25. Proportional reasoning	**4**		
Q26. Exchange rates	**3**		
Q27 Recipes	**3**		
Q28. Pythagoras and trig	**4**		
Q29. Bearings	**5**		
Q30. Angle facts	**4**		
Q31. Interior angles	**4**		
Q32. Angle facts	**4**		
Q33. Indices	**2**		
Q34. Simplifying	**3**		
Q35. Reasoning	**4**		
Q36. Forming and solving	**4**		
Q37. Completing the square	**4**		
Q38. Quadratic formula	**3**		
Q39. Constructions	**3**		
Q40. Scale drawing	**3**		
	143		

Q1. Work out $3\frac{4}{5} + \frac{3}{7}$

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

(Total for question = 3 marks)

Q2.

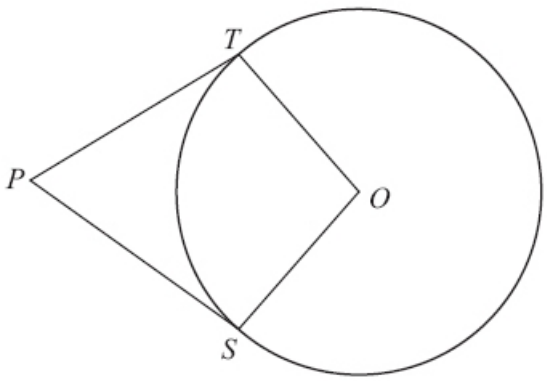


Diagram **NOT** accurately drawn

S and *T* are points on the circumference of a circle, centre *O*.
PT and *PS* are tangents.
Angle *TPO* = 24°.

Work out the size of angle *SOT*.

. . . . . °

(Total for Question is 3 marks)

Q3. Prove algebraically that the recurring decimal $0.1\dot{7}\dot{8}$ can be written as the fraction $\frac{59}{330}$

(Total for question = 3 marks)

4. Solve the simultaneous equations

$$4x + 2y = 7$$
$$3x - 5y = -24$$

x = ...

y = ...

(Total for question = 4 marks)

Q5. Solve $\frac{4x-1}{5} + \frac{x+4}{2} = 3$

x = ...

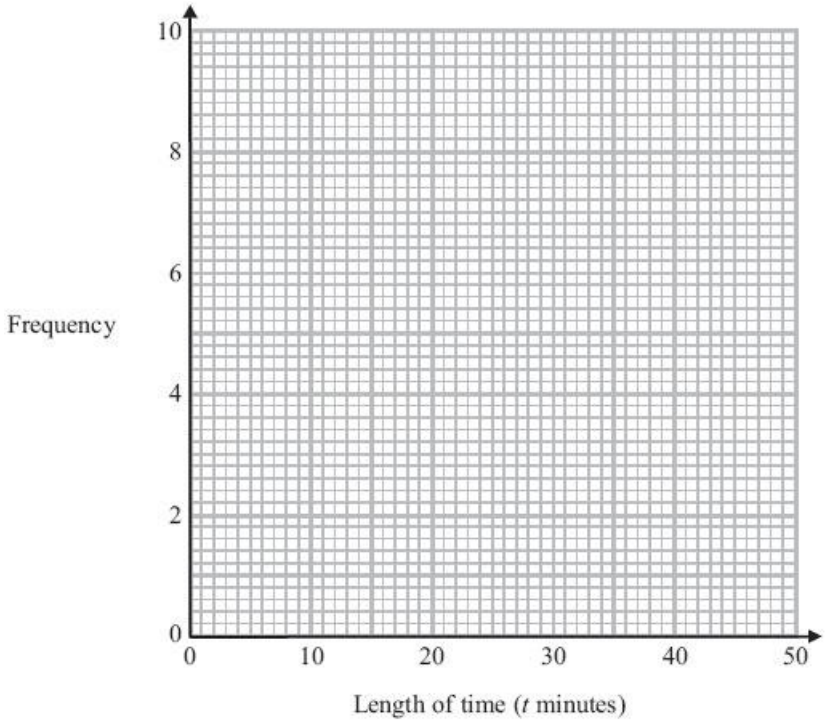
(Total for Question is 3 marks)

Q6. Helen went on 35 flights in a hot air balloon last year.

The table gives some information about the length of time, t minutes, of each flight.

Length of time (t minutes)	Frequency
$0 < t \leqslant 10$	6
$10 < t \leqslant 20$	9
$20 < t \leqslant 30$	8
$30 < t \leqslant 40$	7
$40 < t \leqslant 50$	5

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



(Total for Question is 2 marks)

Q7. The table shows information about 1065 students.

	Male	Female
Year 7	126	109
Year 8	112	134
Year 9	121	114
Year 10	87	94
Year 11	88	80

Elena takes a stratified sample of 120 students by year group and by gender.

Work out the number of Year 8 female students in her sample.

.....

(Total for Question is 2 marks)

Q8. The pie chart shows information about how the students in Year 11 get to school.

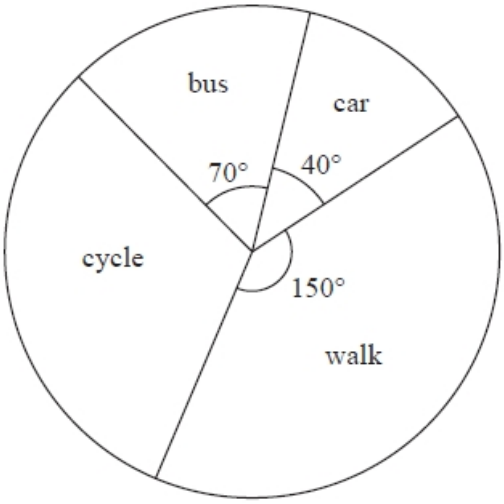


Diagram **NOT** accurately drawn

Mr Morley says, "Less than 10% of students in Year 11 get to school by car".

(a) Is Mr Morley correct?
You must explain your answer.

(2)

50 students in Year 11 cycle to school.

(b) How many students in Year 11 walk to school?

.....**(3)**

(Total for Question is 5 marks)

Q9. Judy drives at an average speed of 80 km per hour for 2 hours 45 minutes.
Work out the number of **miles** Judy drives.

. . . . . miles

(Total for Question is 3 marks)

Q10. Lyndsey records the number of miles (m) she drives each day for 120 days.
Some information about the results is given in the table.

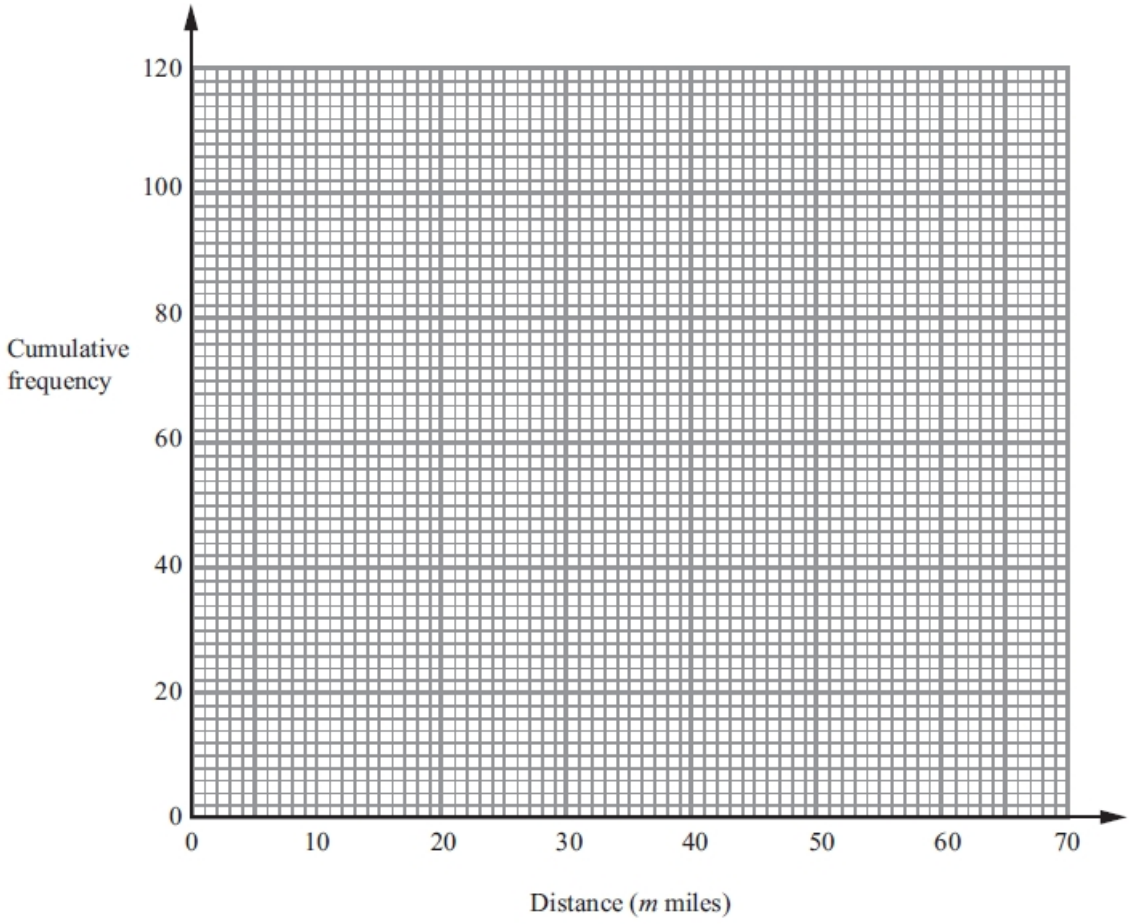
Distance (m miles)	Frequency
$0 < m \leqslant 10$	4
$10 < m \leqslant 20$	18
$20 < m \leqslant 30$	24
$30 < m \leqslant 40$	40
$40 < m \leqslant 50$	24
$50 < m \leqslant 60$	10

(a) Complete the cumulative frequency table.

Distance (m miles)	Cumulative frequency
$0 < m \leqslant 10$	
$0 < m \leqslant 20$	
$0 < m \leqslant 30$	
$0 < m \leqslant 40$	
$0 < m \leqslant 50$	
$0 < m \leqslant 60$	

(1)

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



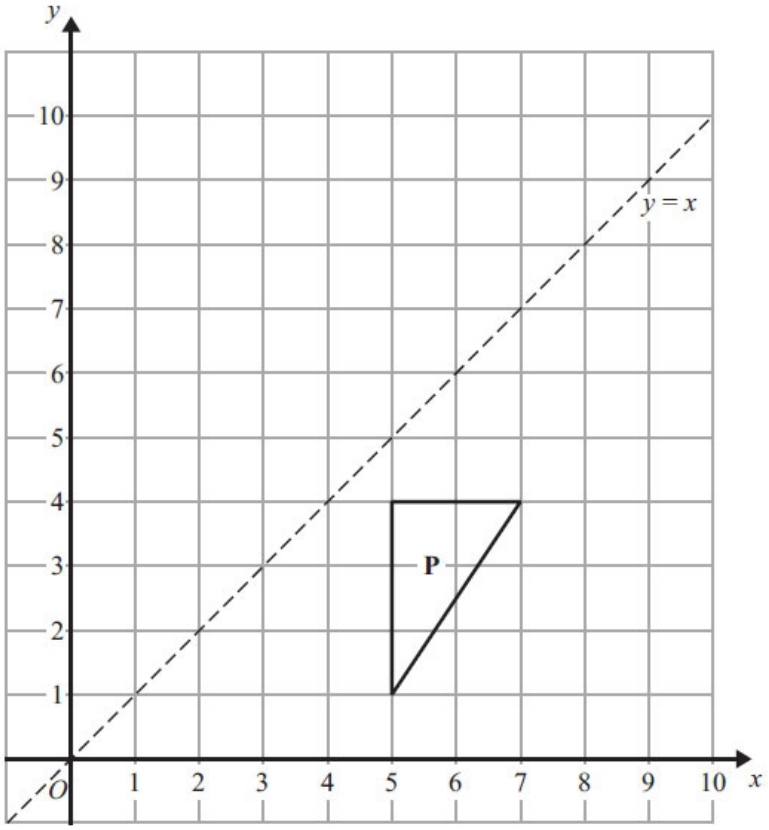
(2)

(c) Work out an estimate for the number of days on which Lyndsey drives more than 36 miles.

.....days **(2)**

(Total for Question is 5 marks)

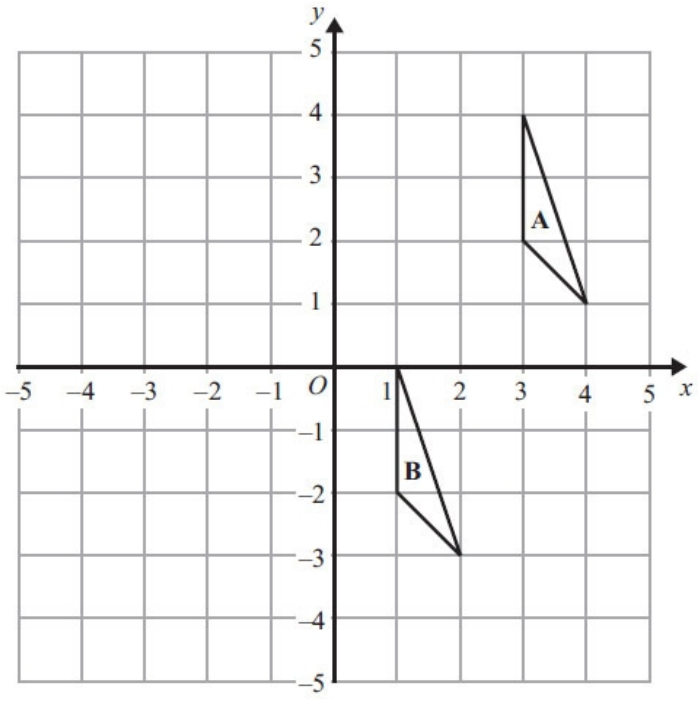
Q11. a)



Reflect shape **P** in the line $y = x$

(2)

(b)



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

(2)

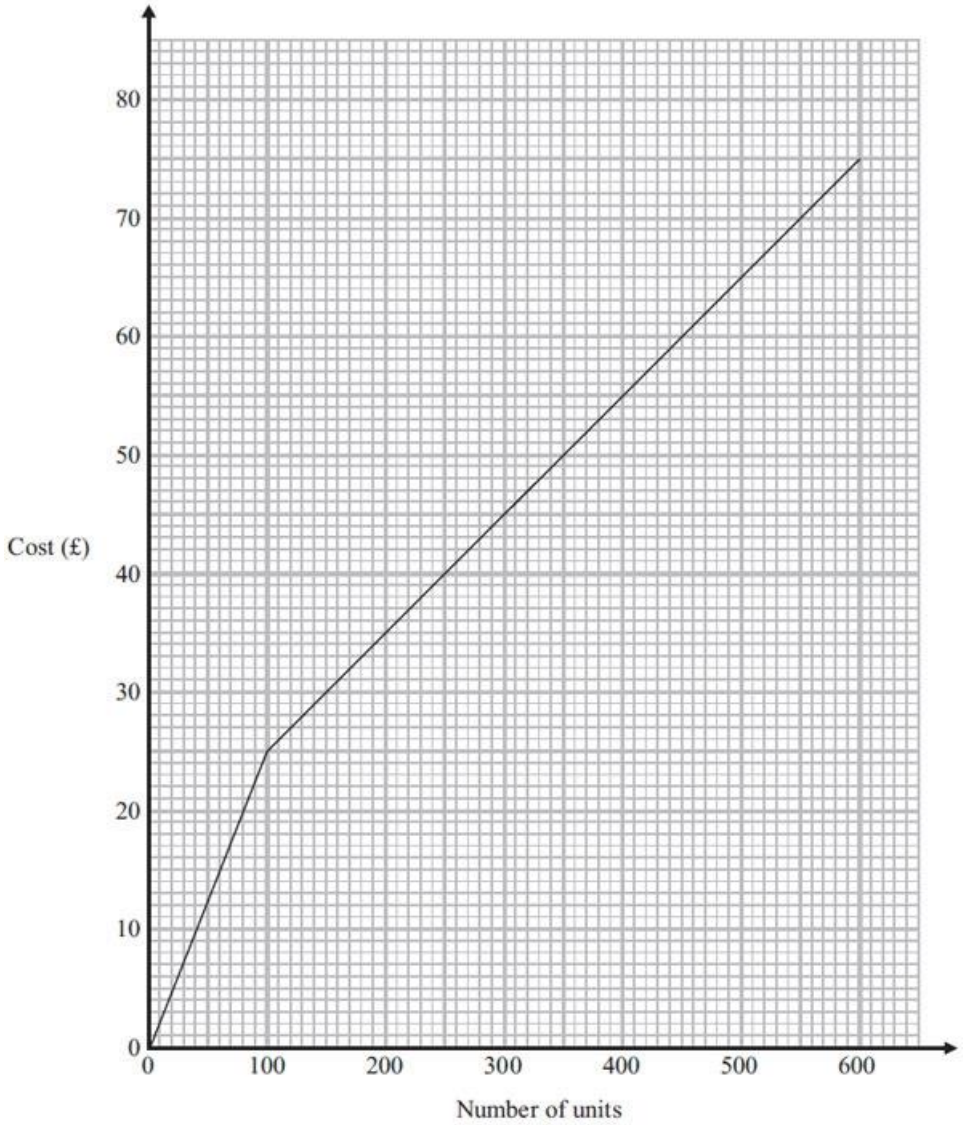
(Total for Question is 4 marks)

Q12 You can use the graph below to find out how much Lethna has to pay for the units of electricity she has used.

Lethna pays at one rate for the first 100 units of electricity she uses.
She pays at a different rate for all the other units of electricity she uses.

Lethna uses a total of 900 units of electricity.

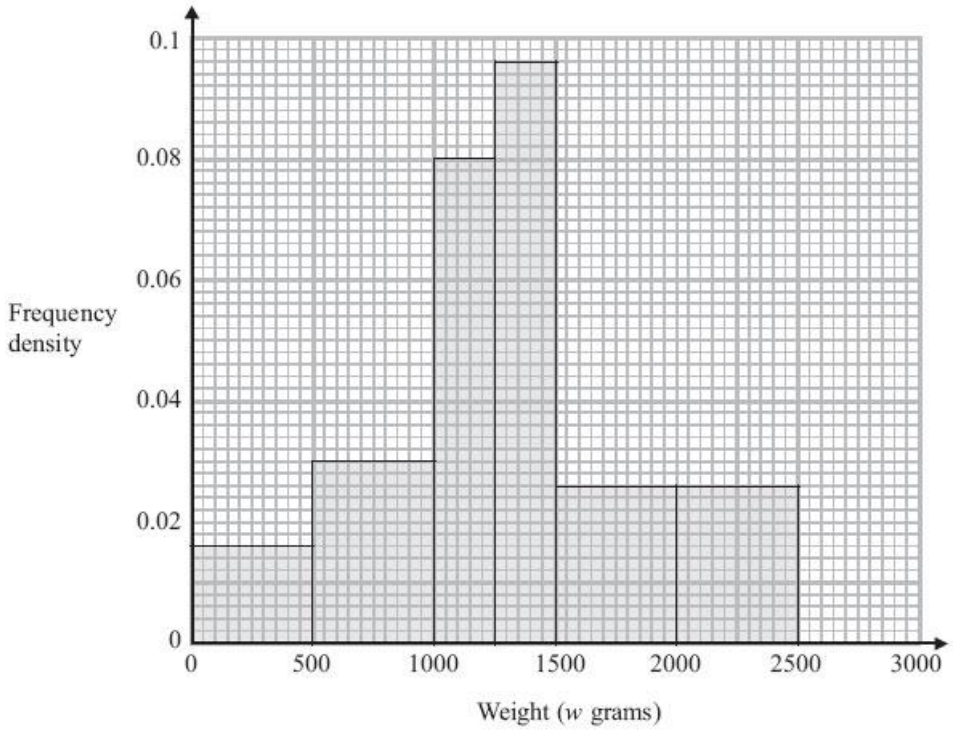
Work out how much she must pay.



(Total for Question is 3 marks)

Q13 Jim went on a fishing holiday.

The histogram shows some information about the weights of the fish he caught.



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

Weight (w grams)	Frequency
$0 < w \leqslant 500$	8
$500 < w \leqslant 1000$	
$1000 < w \leqslant 1250$	
$1250 < w \leqslant 1500$	
$1500 < w \leqslant 2500$	

(2)

Jim kept all the fish he caught with a weight greater than 2000 g.

(b) Find the ratio of the number of fish Jim kept to the total number of fish he caught.

(2)

(c) Use the histogram to find an estimate of the median.

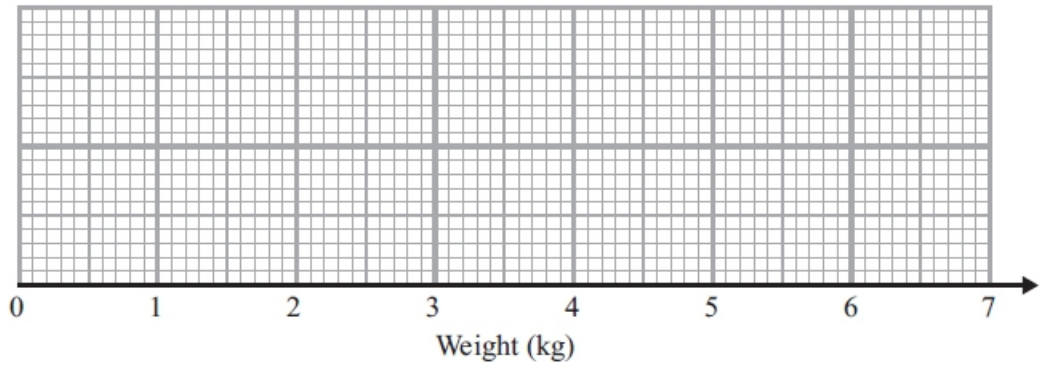
(2)

(Total for Question is 6 marks)

Q14 The table gives some information about the weights of 60 babies.

Lowest	2.0 kg
Highest	6.5 kg
Lower quartile	2.8 kg
Upper quartile	4.2 kg
Median	3.0 kg

(a) Draw a box plot to show this information.



(2)

There are 60 babies.

(b) Work out an estimate for the number of these babies with a weight greater than 2.8 kg.

(2)

(Total for Question is 4 marks)

Q15. (a) Factorise $y^2 - 5y - 14$

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

(b) Expand and simplify $(2\sqrt{5} + 1)(3\sqrt{5} - 1)$

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

(c) Write $\frac{6}{\sqrt{12}}$ in the form $\sqrt{n}$, where n is an integer.

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

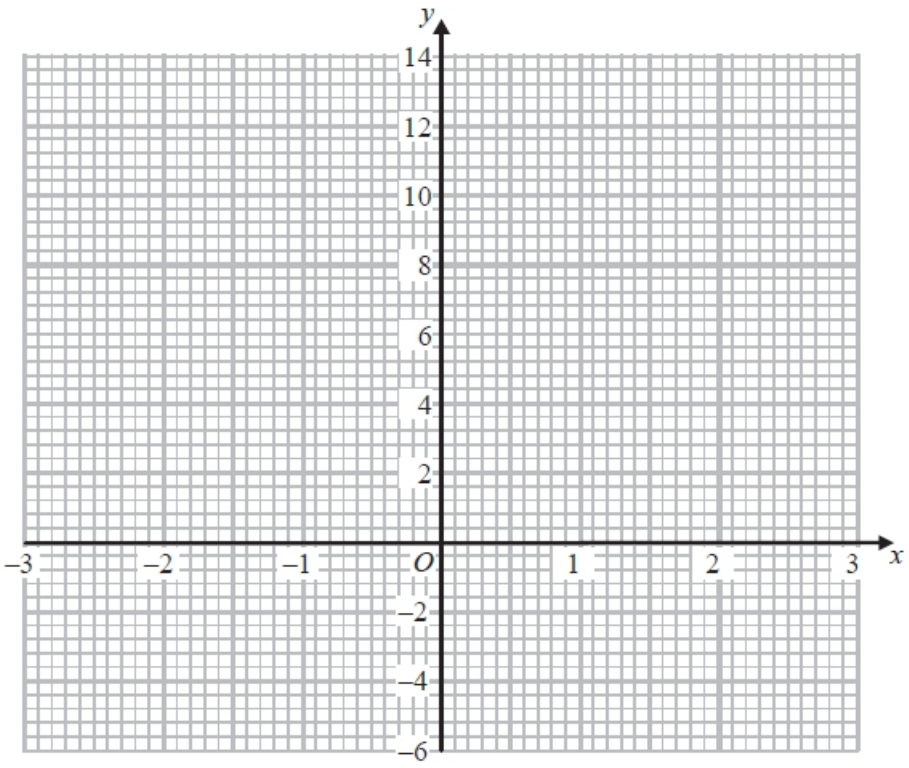
(Total for question = 6 marks)

Q16. (a) Complete the table of values for $y = x^3 - 6x + 4$

x	−3	−2	−1	0	1	2	3
y	−5		9			0	13

(2)

(b) On the grid, draw the graph of $y = x^3 - 6x + 4$ for values of x from −3 to 3



(2)

(Total for question = 4 marks)

Q17. $I = \frac{V}{R}$

V = 250 correct to the nearest 5

R = 3900 correct to the nearest 100

Work out the lower bound for the value of I.
Give your answer correct to 3 decimal places.
You must show your working.

.....

(Total for question = 3 marks)

Q18. Ben and Lago have some identical packets.

Ben has 20 of the packets.
The total weight of Ben's packets is 32 kg.

Lago has 25 of the packets.

Work out the total weight of Lago's packets.

..... kg

(Total for question = 2 marks)

Q19. Danny bought a car for £10 000

The value of the car depreciated by 20% in the first year.
Then the value of the car depreciated by 10% in the second year.

Work out the value of Danny's car at the end of two years.

£ . . . . . .

(Total for Question is 3 marks)

Q20. Derek buys a house for £150 000

He sells the house for £154 500

(a) Work out Derek's percentage profit.

(3)

Derek invests £154 500 for 2 years at 4% per year compound interest.

(b) Work out the value of the investment at the end of 2 years.

(3)

(Total for Question is 6 marks)

Q21. *ABD* is a right angled triangle.

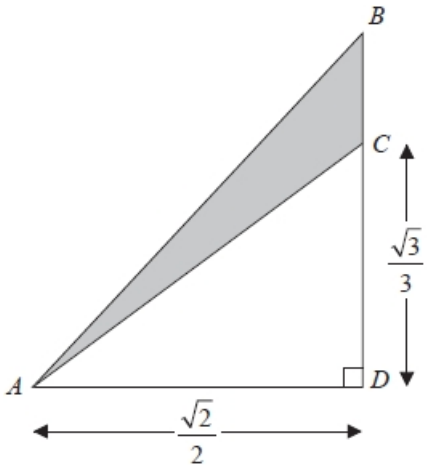


Diagram **NOT** accurately drawn

All measurements are given in centimetres.

C is the point on *BD* such that $CD = \frac{\sqrt{3}}{3}$

$AD = BD = \frac{\sqrt{2}}{2}$

Work out the exact area, in cm^2, of the shaded region.

..... cm^2

(Total for question = 3 marks)

Q22 The diagram shows the floor plan of Jill's dining room.

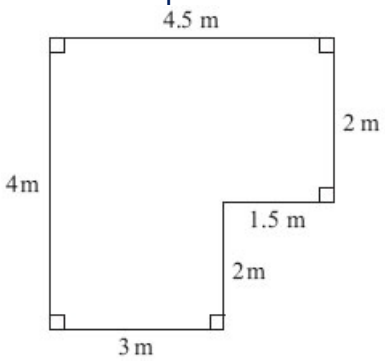


Diagram **NOT** accurately drawn

Jill is going to cover the floor with wooden floorboards.

The floorboards are sold in packs.
One pack of floorboards will cover 2.25 m^2.

Work out how many packs Jill needs.
You must show all your working.

(Total for Question is 4 marks)

Q23 Grace and Jack share £140 in the ratio 3 : 4

Work out the amount of money that Jack gets.

£ . . . . . .

(Total for Question is 2 marks)

Q24

Rita is going to make some cheeseburgers for a party.

She buys some packets of cheese slices and some boxes of burgers.

There are 20 cheese slices in each packet.

There are 12 burgers in each box.

Rita buys exactly the same number of cheese slices and burgers.

(i) How many packets of cheese slices and how many boxes of burgers does she buy?

..... packets of cheese slices

..... boxes of burgers

Rita wants to put one cheese slice and one burger into each bread roll.

She wants to use all the cheese slices and all the burgers.

(ii) How many bread rolls does Rita need?

..... bread rolls

(Total for Question is 4 marks)

Q25A rectangle has an area of 4 $m^{2.}$

Write this area in cm^2.

..... cm^2

(Total for question = 2 marks)

Q26 Ben goes on holiday to Hong Kong.

In Hong Kong, Ben sees a camera costing HK$3179.55

In London, an identical camera costs £285

The exchange rate is £1 = HK$12.30

Ben buys the camera in Hong Kong.

How much cheaper is the camera in Hong Kong than in London?

.....

(Total for Question is 3 marks)

Q27. Here are the ingredients needed to make 16 chocolate biscuits.

Chocolate biscuits

Makes **16** chocolate biscuits

100 g	of butter
50 g	of caster sugar
120 g	of flour
15 g	of cocoa

Sabrina has 250 g of butter
300 g of caster sugar
600 g of flour
and 60 g of cocoa

Work out the greatest number of chocolate biscuits Sabrina can make.
You must show your working.

(Total for Question is 3 marks)

28

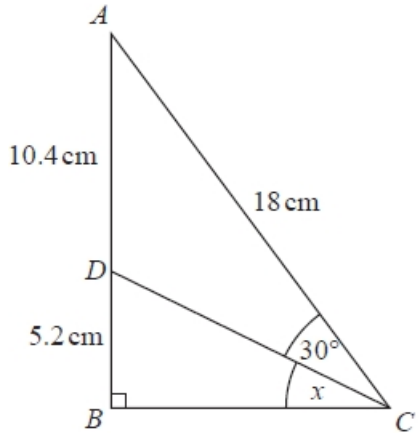


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.
D is a point on *AB*.

Angle *ACD* = 30°
AD = 10.4 cm
DB = 5.2 cm
AC = 18 cm

Work out the size of the angle marked *x*.
Give your answer correct to 1 decimal place.

..... °

(Total for question = 4 marks)

Q29

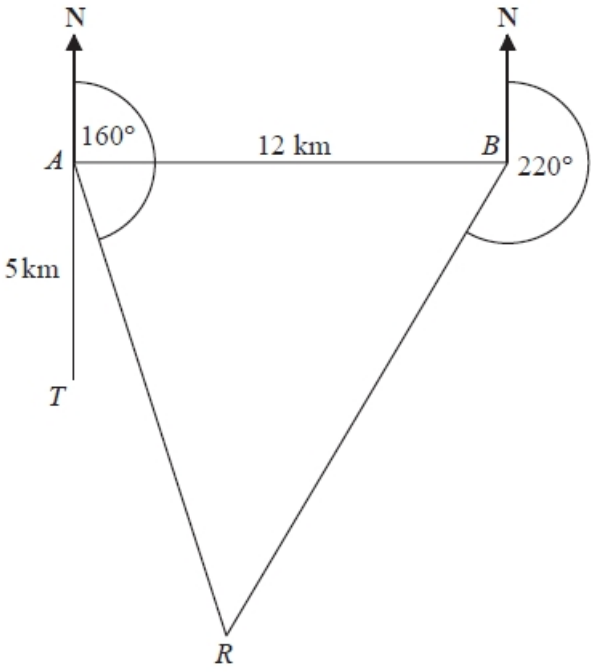


Diagram **NOT** accurately drawn

There is a coastguard station at point *A* and at point *B*.
B is due East of *A*.
The distance from *A* to *B* is 12 km.

There is a rowing boat at point *R*.
R is on a bearing of 160° from A.
R is on a bearing of 220° from B.

There is a speedboat at point *T*.
T is 5 km due South of *A*.

Work out the shortest distance from *T* to *R*.
Give your answer correct to 1 decimal place.
You must show all your working.

.....km

(Total for question = 5 marks)

Q30

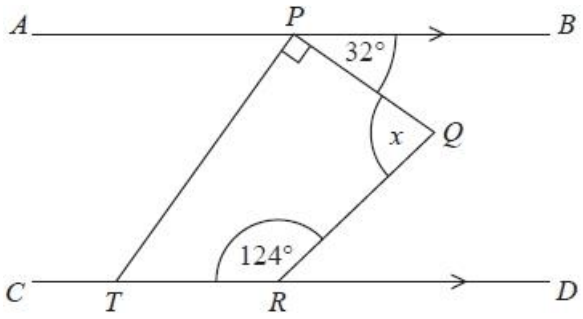


Diagram **NOT** accurately drawn

APB is parallel to *CTRD*.
PQRT is a quadrilateral.

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

..... °

(Total for question = 4 marks)

Q31

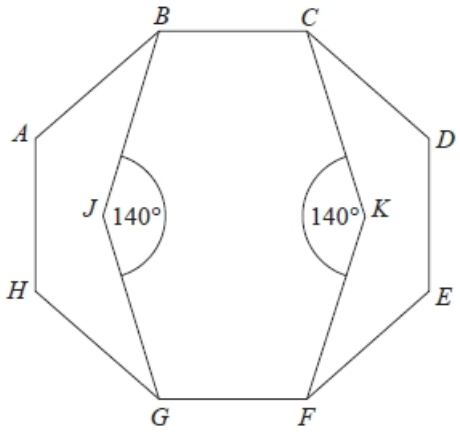


Diagram **NOT** accurately drawn

ABCDEFGH is a regular octagon.
BCKFGJ is a hexagon.

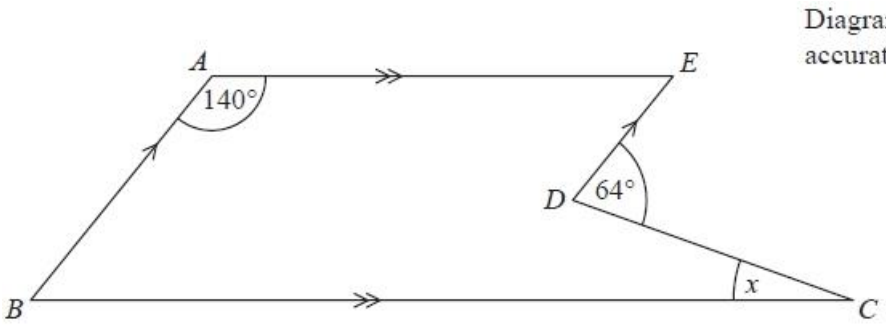
JK is a line of symmetry of the hexagon.
Angle *BJG* = angle *CKF* = 140°

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

..... °

(Total for Question is 4 marks)

Q32. The diagram shows a pentagon *ABCDE*.



AE is parallel to *BC*.
BA is parallel to *DE*.

Angle *EDC* = 64°
Angle *BAE* = 140°

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

(Total for question = 4 marks)

Q33 Write these numbers in order of size.

Start with the smallest number.

5^{-1} 0.5 −5 5^0

(Total for Question is 2 marks)

Q34 (a) Simplify $m^5 \div m^3$

(1)

(b) Simplify $5x^4y^3 \times x^2y$

(2)

(Total for Question is 3 marks)

Q35 Vicky makes 8 purses and 9 key rings to sell for charity.
The price of a purse will be twice as much as the price of a key ring.

Vicky wants to get a total of exactly £40 when she sells all the purses and all the key rings.

Work out the price Vicky needs to charge for each purse and for each key ring.

(Total for Question is 4 marks)

Q36 Asha and Lucy are selling pencils in a school shop.

They sell boxes of pencils and single pencils.

Asha sells 7 boxes of pencils and 22 single pencils.
Lucy sells 5 boxes of pencils and 2 single pencils.
Asha sells twice as many pencils as Lucy.

Work out how many pencils there are in a box.

(Total for question = 4 marks)

Q37 The expression $x^2 - 8x + 6$ can be written in the form $(x - p)^2 + q$ for all values of x.

(a) Find the value of p and the value of q.

p = ...

q = ...

(3)

The graph of $y = x^2 - 8x + 6$ has a minimum point.

(b) Write down the coordinates of this point.

(..... , ...)

(1)

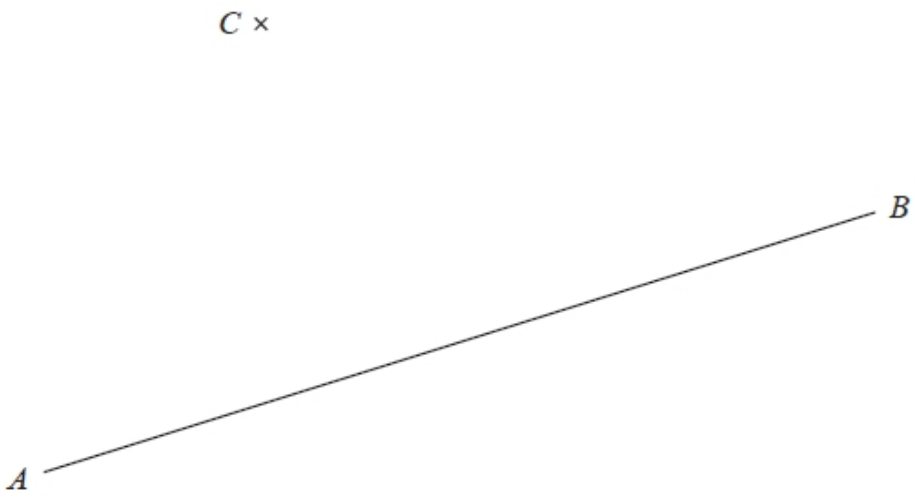
(Total for question = 4 marks)

Q38 Solve $2x^2 + 4x - 5 = 0$
Give your solutions correct to 2 decimal places.

.....

(Total for question = 3 marks)

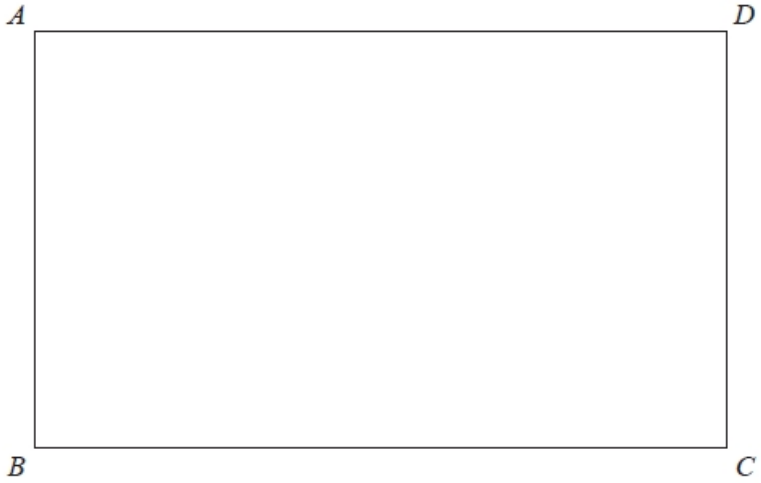
Q39. Use ruler and compasses to **construct** the perpendicular from point *C* to the line *AB*.
You must show all your construction lines.



(Total for Question is 2 marks)

Q40 Here is a scale drawing of an office.

The scale is 1 cm to 2 metres.



A photocopier is going to be put in the office.
The photocopier has to be closer to *B* than it is to *A*.
The photocopier also has to be less than 8 metres from *C*.

Show, by shading, the region where the photocopier can be put.

(Total for question = 3 marks)