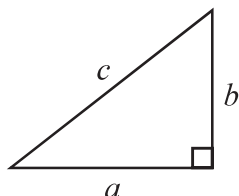


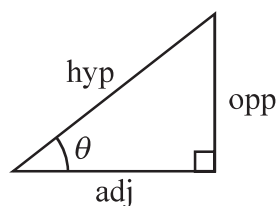
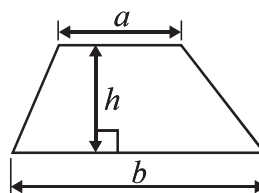
International GCSE MATHEMATICS

FORMULAE SHEET – FOUNDATION TIER

Pythagoras' Theorem
 $a^2 + b^2 = c^2$



Area of a trapezium = $\frac{1}{2}(a + b)h$



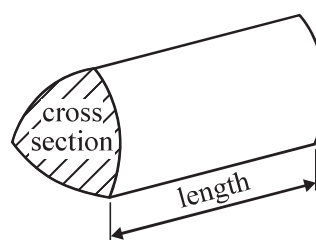
adj = hyp \times cos θ
 opp = hyp \times sin θ
 opp = adj \times tan θ

Volume of prism = area of cross section \times length

or $\sin \theta = \frac{\text{opp}}{\text{hyp}}$

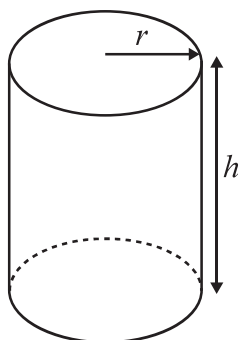
$\cos \theta = \frac{\text{adj}}{\text{hyp}}$

$\tan \theta = \frac{\text{opp}}{\text{adj}}$



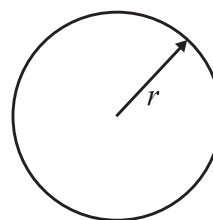
Circumference of circle = $2\pi r$

Area of circle = πr^2



Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi r h$



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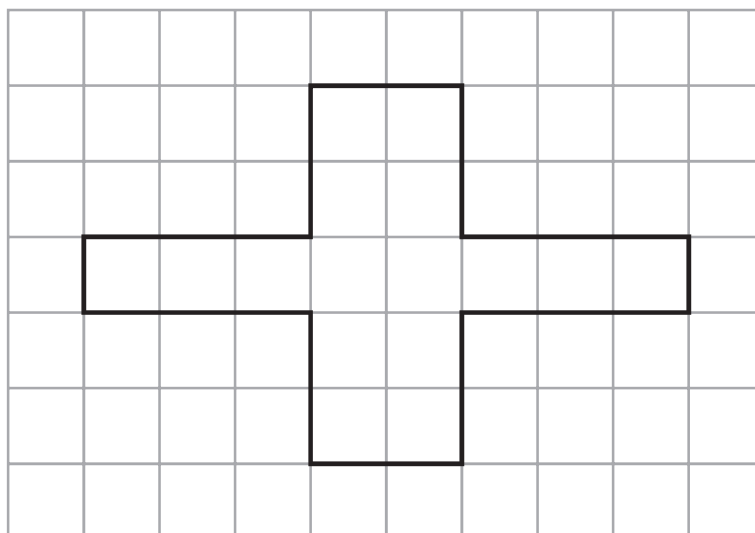
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Answer ALL TWENTY TWO questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The diagram shows a shape on a centimetre grid.



(a) Find the area of the shape.

..... cm²
(1)

(b) Find the perimeter of the shape.

..... cm
(1)

(c) Write down the order of rotational symmetry of the shape.

.....
(1)

(d) On the shape, draw all the lines of symmetry.

(2)

(Total for Question 1 is 5 marks)



2 The table shows the weights of seven animals.

Animal	Weight (kg)
buffalo	851
crocodile	785
elephant	8491
giraffe	1391
hippopotamus	2506
rhinoceros	2371
walrus	1154

(a) Which of these animals has the greatest weight?

.....
(1)

(b) Write the number 2506 in words.

.....
(1)

(c) Write down the value of the 7 in the number 2371

.....
(1)

(d) Write the number 1154 correct to the nearest 100

.....
(1)

(e) Which number in the table is a multiple of 5?

.....
(1)

(f) Work out the difference between the weight of the giraffe and the weight of the buffalo.

..... kg
(1)

(Total for Question 2 is 6 marks)



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3 Here are the first five terms of a number sequence.

3 10 17 24 31

(a) Write down the next two terms of the sequence.

.....
(2)

(b) Explain how you worked out your terms.

.....
(1)

(c) Work out the 18th term of the sequence.

.....
(2)

The 35th term of the sequence is 241

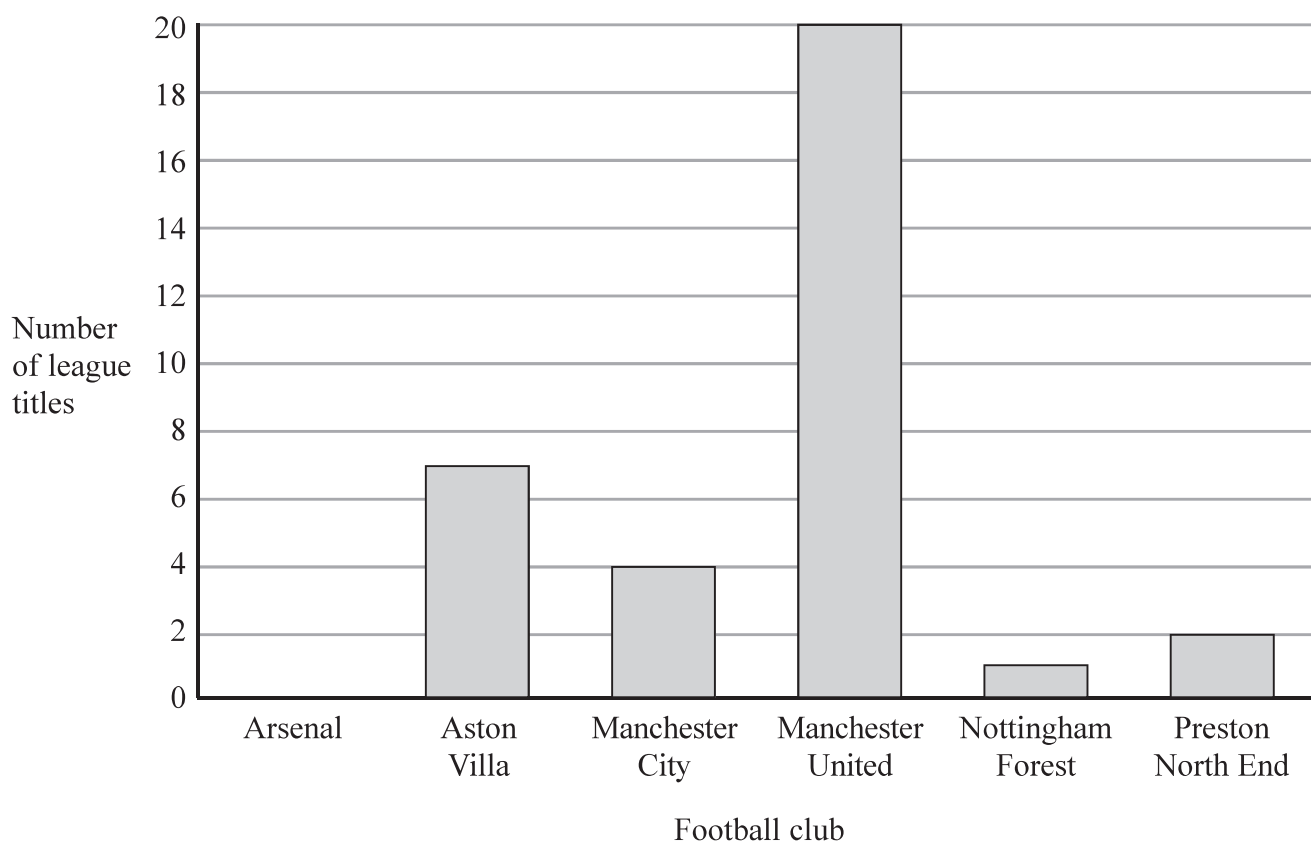
(d) Work out the 34th term of the sequence.

.....
(1)

(Total for Question 3 is 6 marks)



4 The bar chart shows information about the number of league titles won by each of five football clubs up to 2016



(a) Write down the number of league titles won by Aston Villa.

.....
(1)

Arsenal has won 13 league titles.

(b) Draw a bar on the bar chart to show this information.

(1)

Alex says,

‘The number of league titles won by Manchester City is $\frac{1}{4}$ of the number of league titles won by Manchester United’.

(c) Explain why Alex is wrong.

.....
.....
(1)



(d) Find the ratio of the number of league titles won by Manchester United to the number of league titles won by Preston North End.
Give your answer in its simplest form.

.....
(2)

(Total for Question 4 is 5 marks)

5 Here are the number of runs scored by a cricket player in each of 9 games of cricket.

13 89 36 8 4 55 40 22 16

(a) Find the median number of runs.

.....
(2)

(b) Work out the range.

.....
(2)

(Total for Question 5 is 4 marks)



- 6 The table shows the midday temperature in each of five cities on Tuesday one week.

City	Temperature ($^{\circ}\text{C}$)
Anchorage	-11
Beijing	-2
Dhaka	25
Moscow	-5
Yellowknife	-30

- (a) Which of these cities had the lowest temperature?

.....
(1)

- (b) Work out the difference between the temperature in Dhaka and the temperature in Moscow.

..... $^{\circ}\text{C}$
(2)

By midday on Wednesday, the temperature in Anchorage had fallen by 6°C .

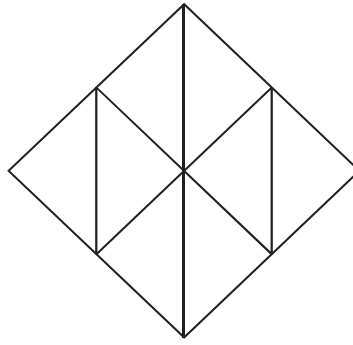
- (c) Work out the temperature in Anchorage at midday on Wednesday.

..... $^{\circ}\text{C}$
(2)

(Total for Question 6 is 5 marks)



7



(a) Shade $\frac{1}{4}$ of the shape.

(1)

(b) Write 40% as a decimal.

.....
(1)

$$B = 6e - 3f$$

(c) Work out the value of B when $e = 3.2$ and $f = -4$

.....
(2)

(Total for Question 7 is 4 marks)



8

30	31	32	33	34	35	36	37
----	----	----	----	----	----	----	----

From the numbers in the box

(i) write down a factor of 120

.....

(ii) find the cube root of 32 768

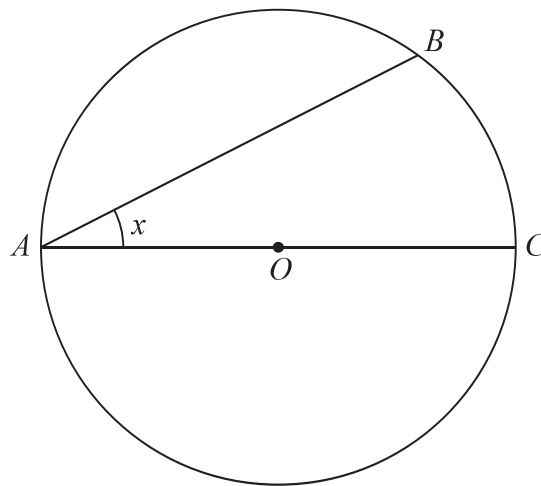
.....

(iii) write down a prime number.

.....

(Total for Question 8 is 3 marks)

9 A, B and C are points on a circle, centre O .



(a) (i) Write down the mathematical name for the line OC .

.....

(ii) Measure the size of the angle marked x .

.....

(2)

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In the diagram, $ABCD$ is a quadrilateral.

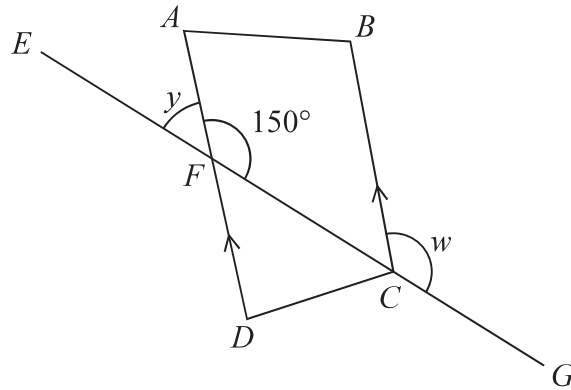


Diagram **NOT** accurately drawn

DA and CB are parallel lines.
 AFD and $EFCG$ are straight lines.

(b) (i) Find the size of angle y .

$$y = \dots\dots\dots^\circ$$

(ii) Give a reason for your answer.

(2)

(c) (i) Find the size of angle w .

$$w = \dots\dots\dots^\circ$$

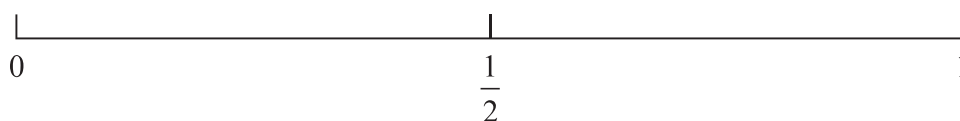
(ii) Give a reason for your answer.

(2)

(Total for Question 9 is 6 marks)



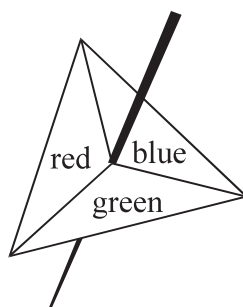
10 Here is a probability scale.



- (a) A fair ordinary dice is thrown once.
- On the probability scale, mark with a cross (×) the probability that the dice will land on a number less than 7
Label this cross A.
 - On the probability scale, mark with a cross (×) the probability that the dice will land on an odd number.
Label this cross B.

(2)

Here is a biased 3-sided spinner.



When the spinner is spun, it can land on red or on blue or on green.
The table shows the probability that the spinner lands on red and the probability that the spinner lands on blue.

Colour	red	blue	green
Probability	0.3	0.25	

Ruochen spins the spinner once.

- (b) Work out the probability that the spinner lands on green.

(2)

(Total for Question 10 is 4 marks)



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11 (a) Simplify $x^2 + x^2 + x^2$

.....
(1)

(b) Simplify $4e + 2f - 6e + 7f$

.....
(2)

(c) Simplify $2 \times a \times 4 \times b$

.....
(1)

(d) Solve $\frac{w}{4} = 12$

$w =$
(1)

(e) Solve $5y + 2 = 14$

$y =$
(2)

(Total for Question 11 is 7 marks)



12 Michael, Julie and Alison went to eat in a restaurant.

The total cost of their meals was \$120

Michael paid $\frac{1}{6}$ of the total cost.

Julie paid 35% of the total cost.

Alison paid the rest of the total cost.

Work out how much Alison paid.

\$

(Total for Question 12 is 4 marks)



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13 Ameresh arrived at Bangkok train station at 6 07 pm.

(a) Write 6 07 pm as a time using the 24-hour clock.

.....
(1)

Ameresh's train left Bangkok station at 7 35 pm.

(b) How many minutes are there between 6 07 pm and 7 35 pm?

..... minutes
(2)

Ameresh's train left Bangkok station at 7 35 pm.
His train journey lasted 8 hours 42 minutes.

(c) At what time did Ameresh's train journey end?
Give your answer using the 12-hour clock.

.....
(2)

(Total for Question 13 is 5 marks)



14 (a) Factorise $10a + 25$

.....
(1)

(b) Factorise $7w^2 - 4w$

.....
(1)

(c) Expand $p^2(p - 5)$

.....
(2)

(d) Expand and simplify $(x - 3)(x + 7)$

.....
(2)

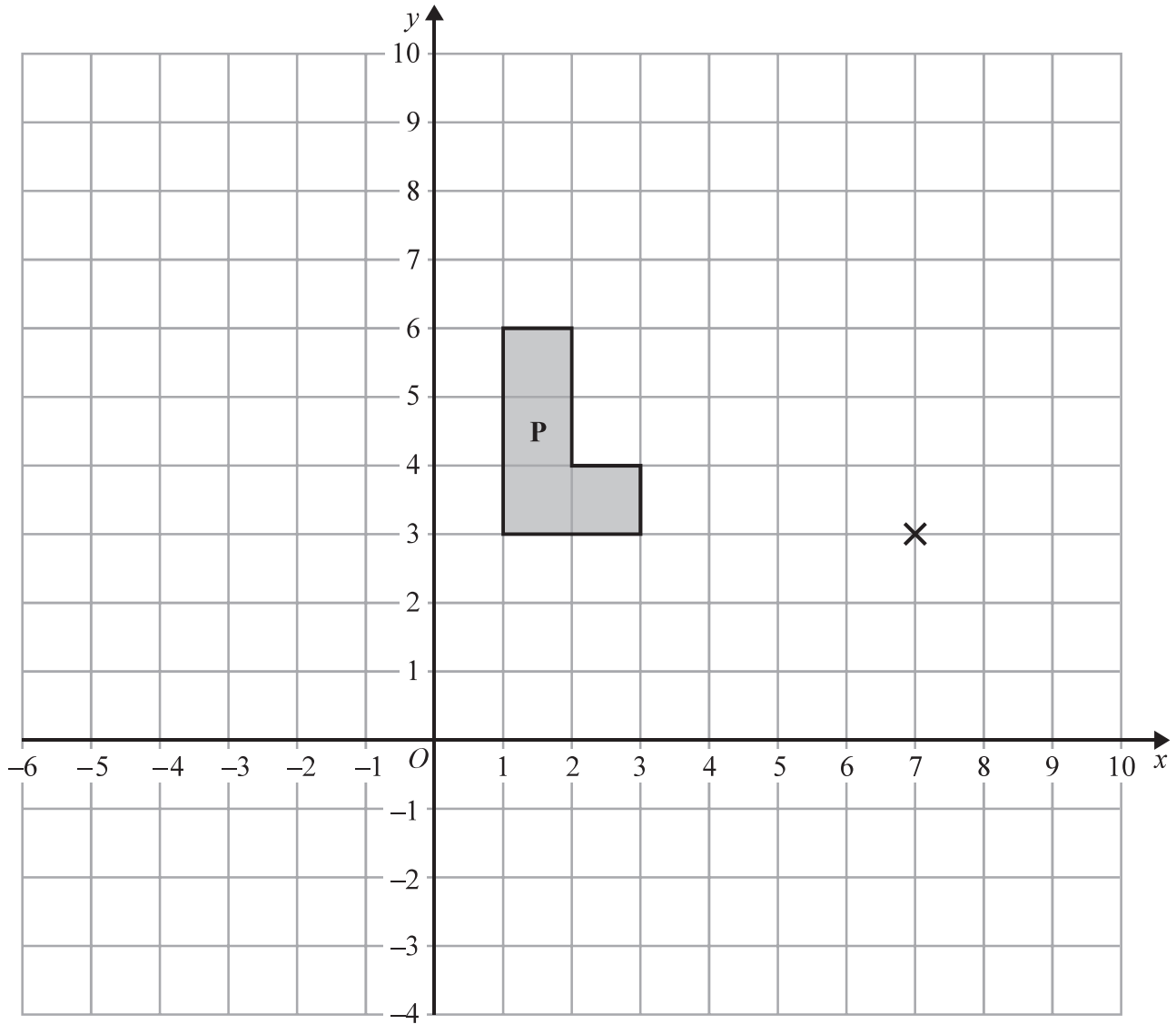
(Total for Question 14 is 6 marks)

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- (a) On the grid, enlarge shape **P** with scale factor 2 and centre $(7, 3)$
Label the new shape **Q**.

(2)

- (b) On the grid, rotate shape **P** through 90° anticlockwise about the point $(7, 3)$
Label the new shape **R**.

(2)

(Total for Question 15 is 4 marks)



16 Here is a list of ingredients needed to make apple and blackberry crumble for 4 people.

Apple and Blackberry Crumble

Ingredients for 4 people

120 grams	flour
80 grams	sugar
90 grams	butter
300 grams	apples
115 grams	blackberries

Rufus wants to make apple and blackberry crumble for 10 people.

(a) Work out the amount of apples he needs.

..... grams
(2)

Roland makes apple and blackberry crumble for a group of people.
He uses 920 grams of blackberries.

(b) Work out the number of people in the group.

.....
(2)

(Total for Question 16 is 4 marks)



17 The table shows information about the lengths, in cm, of 40 leaves.

Length (L cm)	Frequency
$0 < L \leq 1$	4
$1 < L \leq 2$	5
$2 < L \leq 3$	11
$3 < L \leq 4$	14
$4 < L \leq 5$	6

(a) Write down the modal class.

.....
(1)

(b) Work out an estimate for the mean length of the 40 leaves.
Give your answer correct to 1 decimal place.

..... cm
(4)

(Total for Question 17 is 5 marks)



18 (a) Use your calculator to work out the value of

$$\frac{7.3 + 2.1}{6.4} + 2.2^2$$

Give your answer as a decimal.

Write down all the figures on your calculator display.

.....
(2)

(b) Give your answer to part (a) correct to 3 significant figures.

.....
(1)

(Total for Question 18 is 3 marks)

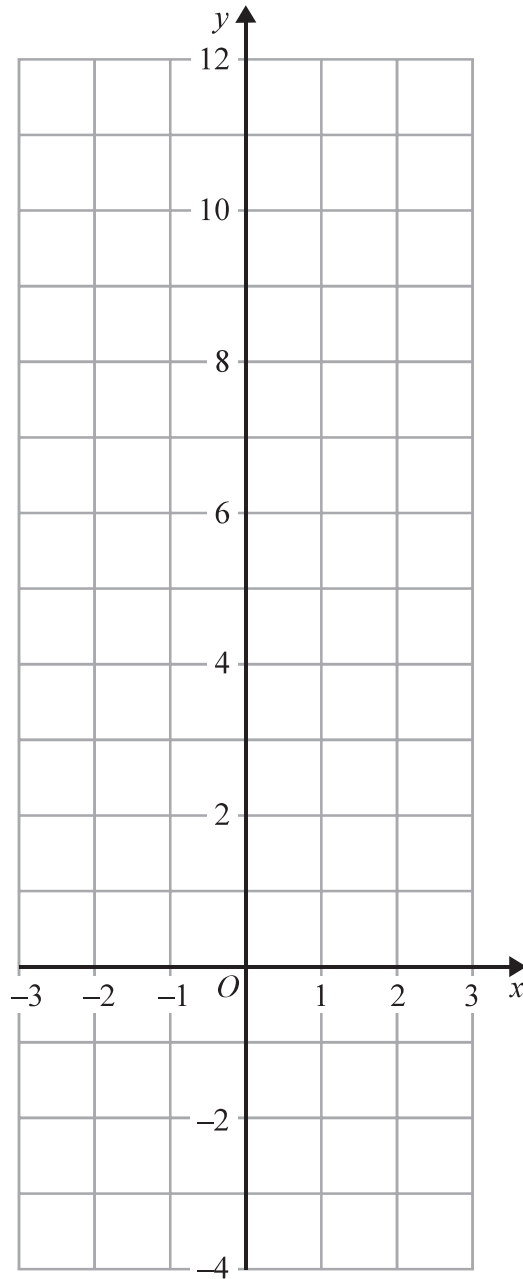


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19 On the grid, draw the graph of $y = 2x + 4$ for values of x from -3 to 3



(Total for Question 19 is 3 marks)



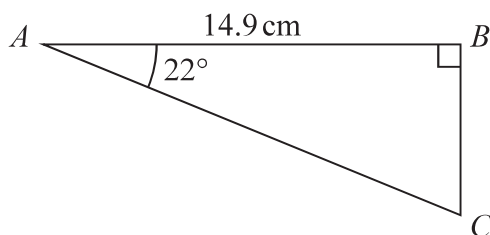


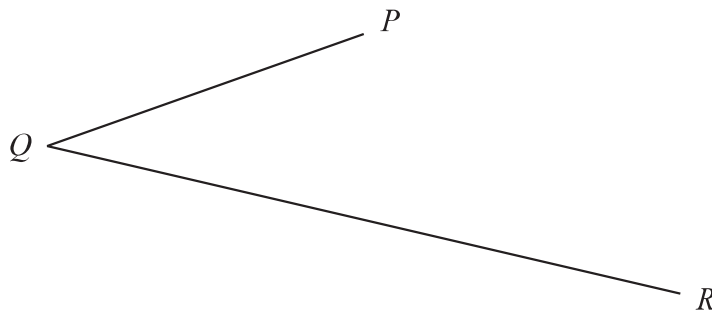
Diagram **NOT**
accurately drawn

Calculate the length of AC .
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 20 is 3 marks)

- 21 Use ruler and compasses to construct the bisector of angle PQR .
You must show all your construction lines.



(Total for Question 21 is 2 marks)



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22 In 2014, Donald's weekly pay was \$640
In 2015, Donald's weekly pay was \$668.80

(a) Work out the percentage increase in Donald's pay between 2014 and 2015

..... %
(3)

In 2015, Donald's weekly pay was 95% of his weekly pay in 2016

(b) Work out Donald's weekly pay in 2016

\$
(3)

(Total for Question 22 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

