

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname StemUp Model Solution

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Tuesday 21 May 2019

Morning

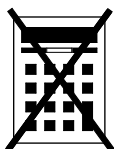
Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- mathematical instruments

You must **not** use a calculator.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

For Examiner's Use

Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26	
TOTAL	

Advice

In all calculations, show clearly how you work out your answer.



J U N 1 9 8 3 0 0 1 F 0 1

Answer **all** questions in the spaces providedDo not write
outside the
box

- 1** Which type of angle is the largest?
Circle your answer.

[1 mark]

right

reflex

obtuse

acute

- 2** Solve $4x = 8$
Circle your answer.

[1 mark] $x = 0.5$ $x = 2$ $x = 4$ $x = 32$

- 3** Work out $10 + (-4)$
Circle your answer.

[1 mark]

-14

-6

6

14



- 4 Circle the calculation which works out half of 12

[1 mark]

$12 \div 0.5$

$2 \div 12$

$12 \times \frac{1}{2}$

$12 \div 50 \times 100$

- 5 (a) Work out $364.5 + 17.9 - 2.08$

[2 marks]

364.5

$+ 17.9$

382.4

382.40

$- 2.08$

380.32

Answer 380.32

- 5 (b) Work out 9.36×2

[1 mark]

$9.36 \times 2 = 18.72$

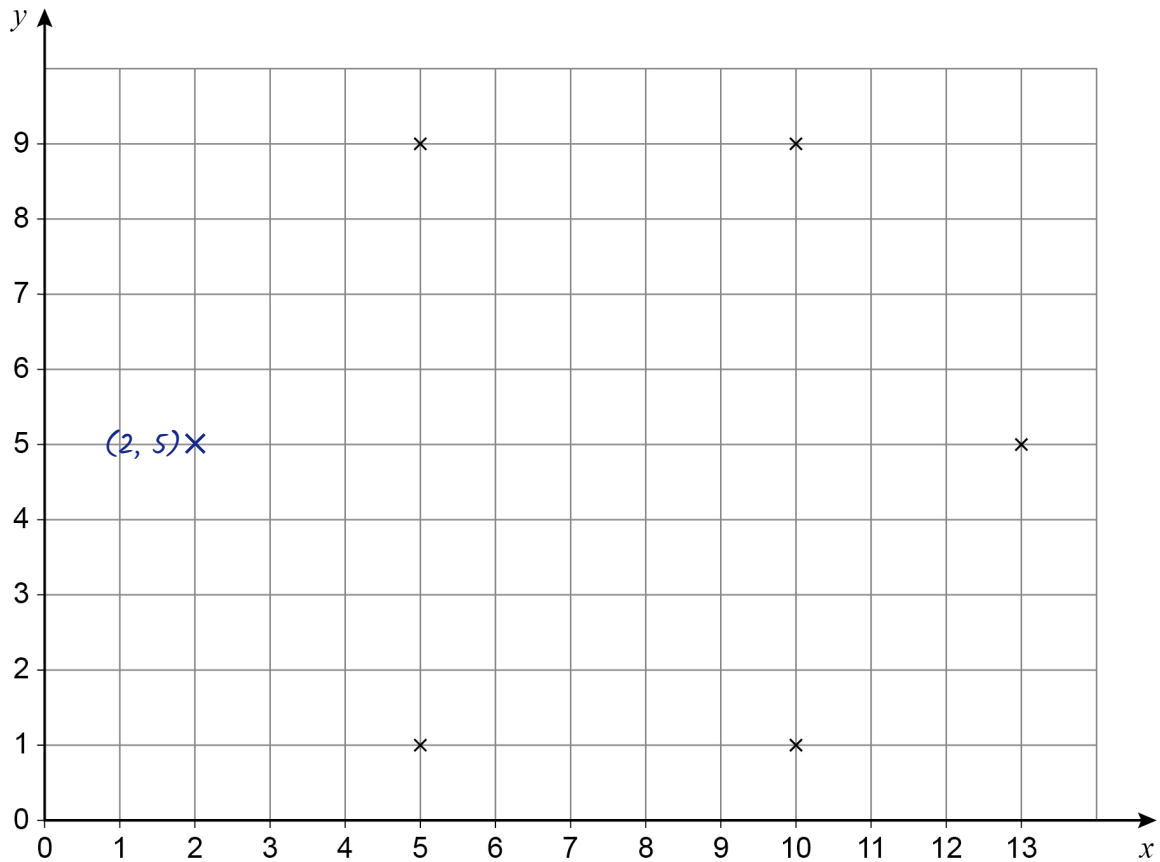
Answer 18.72

Turn over ►



6

Five points are plotted on a centimetre grid.



The points are five of the vertices of a hexagon.

Each side of the hexagon has the same length.

Work out **one** possible pair of coordinates of the other vertex.**[2 marks]**

The hexagon is symmetrical about the line $x = 7.5$,

so (13, 5) reflects to the other vertex at (2, 5)

Answer (2 , 5)



7

Amy and Brad each have some money.

Carly has no money.

Amy gives £7 to Carly.

Brad gives £5 to Carly.

Now they all have the same amount of money.

How much money did Amy have to begin with?

[2 marks]

Carly now has $7 + 5 = £12$

So Amy now has £12 and Brad has £12

Amy at the start: $12 + 7 = £19$

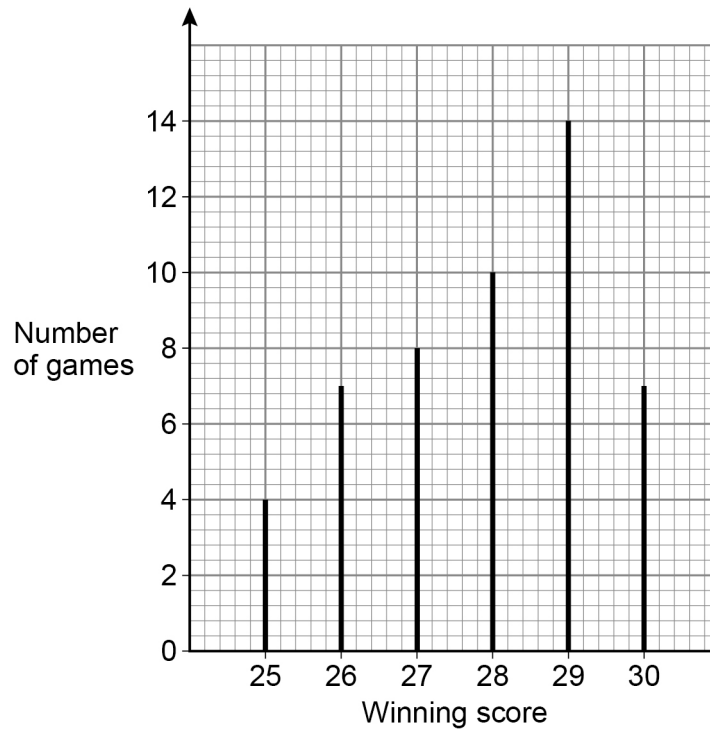
Answer £ 19

Turn over for the next question

Turn over ►



- 8 A game is played 50 times.
The vertical line chart shows the winning scores.



- 8 (a) Write down the mode.

[1 mark]

Answer _____ 29



The game is played again.

- 8 (b) Use the chart to estimate the probability that the winning score is 25

[1 mark]

Answer $\frac{4}{50}$

- 8 (c) Use the chart to estimate the probability that the winning score is 27 or more.

[2 marks]

Scores of 27 or more: $8 + 10 + 14 + 7 = 39$ games

Answer $\frac{39}{50}$

- 9 (a) Write down **all** the factors of 18

[2 marks]

Answer *1, 2, 3, 6, 9, 18*

- 9 (b) Work out the lowest common multiple (LCM) of 12 and 15

[2 marks]

12: 12, 24, 36, 48, 60

15: 15, 30, 45, 60

Lowest common multiple is 60

Answer *60*



- 10** Coaches take people to a festival.
Each coach can take 50 people.

- 10 (a)** From one city there are 820 people.
How many coaches are needed?

[3 marks]

$$820 \div 50$$

$$50 \times 16 = 800$$

$$820 - 800 = 20 \text{ left over}$$

$$820 \div 50 = 16 \text{ r } 20 = 16.4$$

16 coaches is not enough, so 17 coaches

Answer 17



10 (b) From a different city 13 coaches are needed.

Each coach costs £450 to hire.

Work out the total cost of hiring 13 coaches.

[3 marks]

$\times$	400	50	0	
10	4000	500	0	$4000 + 500 + 1200 + 150$
3	1200	150	0	$= 5850$

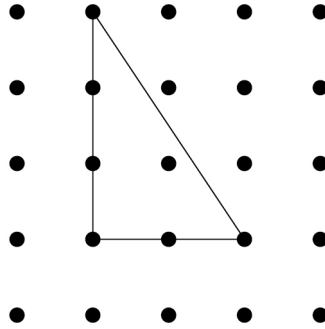
$13 \times 450 = 4500 + 1350 = 5850$

Answer £ 5850

Turn over for the next question

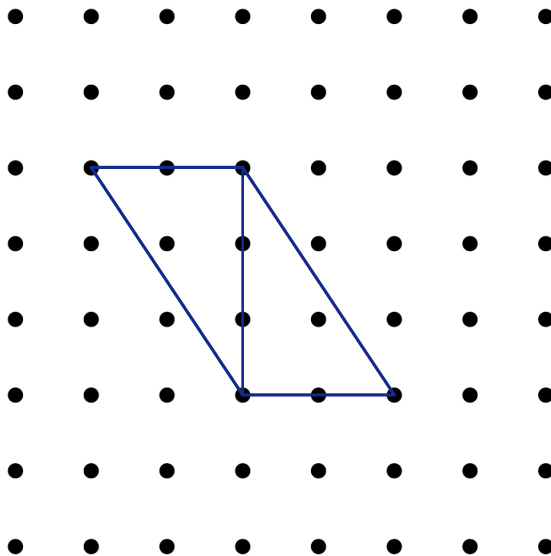


- 11 Here is a triangle on a square dotted grid.



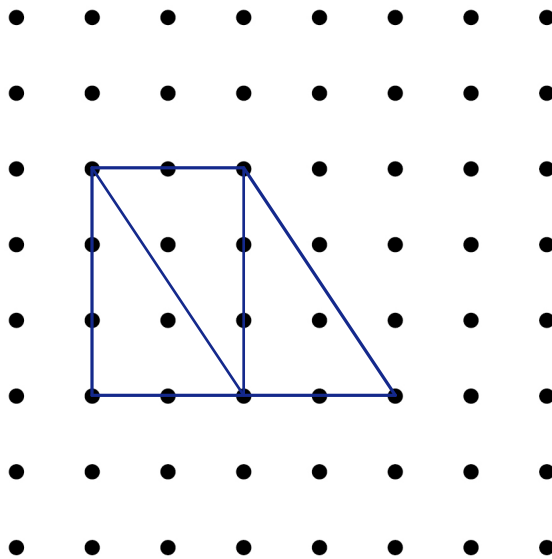
- 11 (a) On the grid below, show how you can make a parallelogram with **two** of these triangles.

[1 mark]



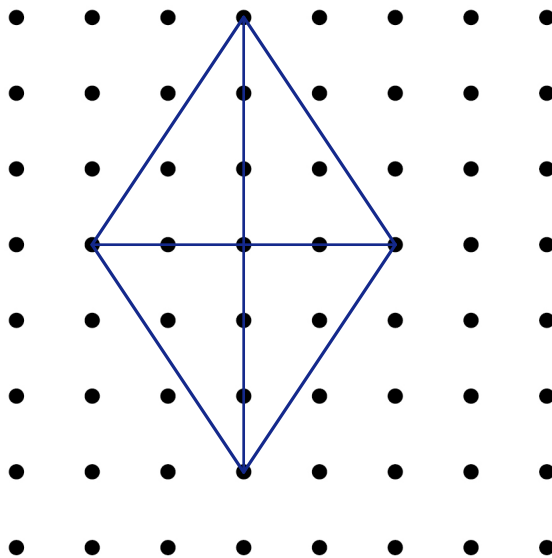
- 11 (b) On the grid below, show how you can make a trapezium with **three** of these triangles.

[1 mark]



- 11 (c) On the grid below, show how you can make a rhombus with **four** of these triangles.

[1 mark]



- 12** Work out 65% of 300 **[3 marks]**

$$10\% \text{ of } 300 = 30$$

$$60\% = 6 \times 30 = 180$$

$$5\% = 30 \div 2 = 15$$

$$65\% = 180 + 15 = 195$$

Answer 195

- 13** In a game the average score was 50
Tom's score was $\frac{5}{2}$ of the average.
Circle Tom's score.

[1 mark]

125

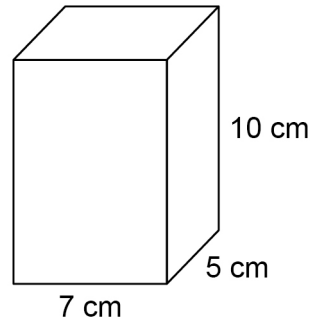
175

30

20



- 14 Here is a cuboid.



Work out the volume.

[2 marks]

$$\text{Volume} = \text{length} \times \text{width} \times \text{height}$$

$$= 7 \times 5 \times 10$$

$$= 35 \times 10$$

$$= 350$$

Answer 350 cm³

- 15 Circle the shape that has a uniform cross section.

[1 mark]

cone

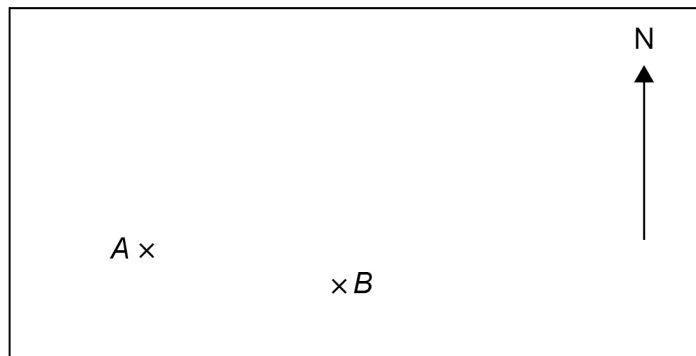
sphere

cylinder

pyramid

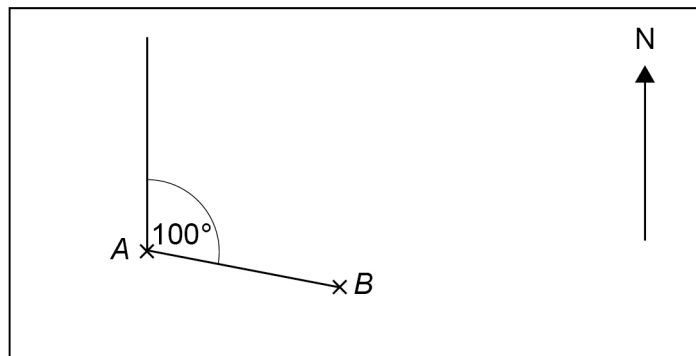


- 16 (a) Here is a map showing points A and B .



Kemal wants to measure the bearing of A from B .

He draws two lines and measures the angle between them.



Kemal says that the bearing of A from B is 100°

Is his method correct?

Give a reason for your answer.

[1 mark]

No. The bearing of A from B must be measured from

the North line at B , clockwise to the line BA .

Kemal measured from A , which gives the bearing of B

from A . The bearing of A from B is $360 - 80 = 280^\circ$



- 16 (b)** On a different map, the bearing of D from C is 045°

Nina says,

" D is North West of C ."

Is Nina correct?

Give a reason for your answer.

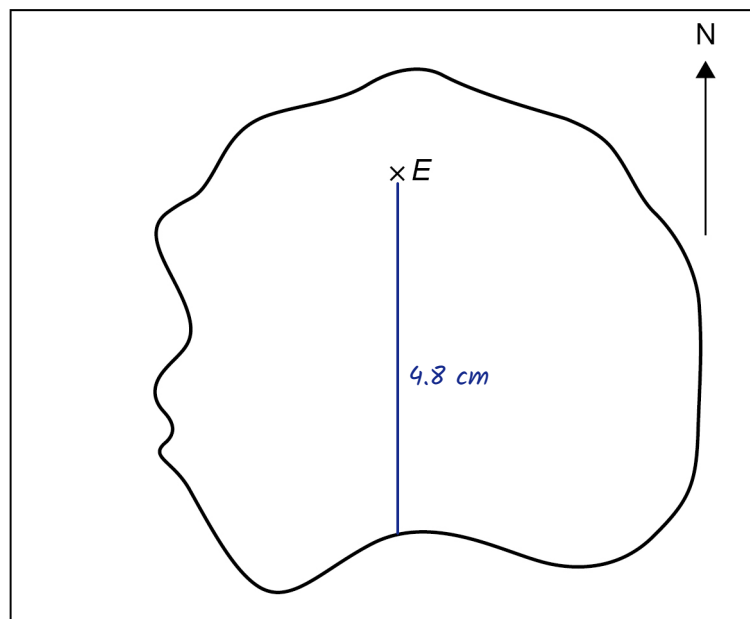
[1 mark]

No. A bearing of 045° is North East of C .

North West would be a bearing of 315° .

- 16 (c)** This map shows an airport, E , on an island.

Scale: 1 cm represents 100 km



A plane flies due South from the airport.

How far does it fly until it reaches the sea?

[3 marks]

Line measures 4.8 cm, so $4.8 \times 100 = 480$ km

Answer 480 km



17 (a) Simplify fully $56 : 24$

[2 marks]

$$56 : 24 (\div 8)$$

$$= 7 : 3$$

Answer 7 : 3

17 (b) Write the ratio $5 : 4$ in the form $n : 1$

[1 mark]

$$5 \div 4 = 1.25$$

$$5 : 4 = 1.25 : 1$$

Answer 1.25 : 1

17 (c) Share £180 in the ratio $1 : 9$

[2 marks]

$$1 + 9 = 10 \text{ parts}$$

$$1 \text{ part} = 180 \div 10 = £18$$

$$9 \text{ parts} = 9 \times 18 = £162$$

$$\text{Check: } 18 + 162 = 180$$

Answer £ 18 and £ 162



18

Here is some data about the people listening to a radio station one day.

	Percentage	Mean number of hours listening	Range of number of hours listening
Aged 40 or under	21	1.2	4.5
Aged 41 or over	79	6.3	13.9

Compare the data for people aged 40 or under with the data for people aged 41 or over.
Make **three** comparisons.

[3 marks]

Comparison 1 A much higher percentage of the listeners were
aged 41 or over (79%) than aged 40 or under (21%).

Comparison 2 On average, people aged 41 or over listened for
longer (mean 6.3 hours compared with 1.2 hours).

Comparison 3 The listening times of people aged 41 or over were
more spread out (range 13.9 hours compared with 4.5 hours).

Turn over for the next question

Turn over ►



19 You are given that $4a - 2b = 10$

19 (a) Write down the value of $2a - b$

[1 mark]

Answer 5

19 (b) Write down the value of $2b - 4a$

[1 mark]

Answer -10

19 (c) You are given that $4a - 2b = 10$ and $a + c = 3$

Write an expression in a , b and c that is equal to 23

Give your answer in its simplest form.

You **must** show your working.

[2 marks]

$$23 = 2 \times 10 + 3$$

$$= 2(4a - 2b) + (a + c)$$

$$= 8a - 4b + a + c$$

$$= 9a - 4b + c$$

Answer $9a - 4b + c$



20 (a) Write 0.00097 in standard form.

[1 mark]

Answer 9.7×10^{-4}

20 (b) Work out $\frac{3 \times 10^5}{4 \times 10^3}$

Give your answer as an ordinary number.

[2 marks]

$$3 \times 10^5 = 300\,000$$

$$4 \times 10^3 = 4000$$

$$300\,000 \div 4000 = 300 \div 4 = 75$$

$$\text{or } (3 \div 4) \times 10^{5-3} = 0.75 \times 100 = 75$$

Answer 75

Turn over for the next question



21 Anna plays a game with an ordinary, fair dice.

If she rolls 1 she wins.

If she rolls 2 or 3 she loses.

If she rolls 4, 5 or 6 she rolls again.

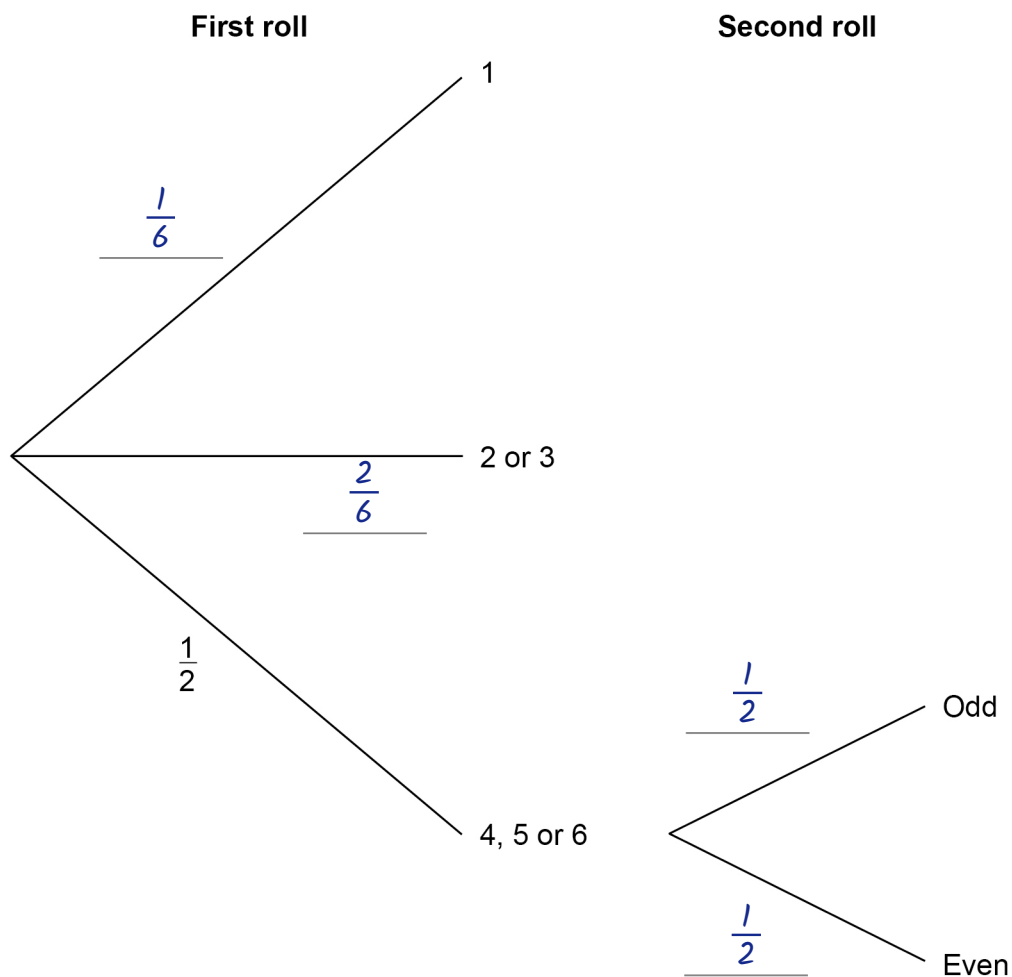
When she has to roll again,

if she rolls an odd number she wins

if she rolls an even number she loses.

21 (a) Complete the tree diagram with the four missing probabilities.

[2 marks]



21 (b) Is Anna more likely to win or to lose?

You **must** work out the probability that she wins.

[4 marks]

$$P(\text{win}) = P(1) + P(4, 5 \text{ or } 6) \times P(\text{odd})$$

$$= \frac{1}{6} + \frac{1}{2} \times \frac{1}{2} = \frac{1}{6} + \frac{1}{4}$$

$$= \frac{2}{12} + \frac{3}{12} = \frac{5}{12}$$

$$P(\text{lose}) = 1 - \frac{5}{12} = \frac{7}{12}$$

$$\frac{7}{12} > \frac{5}{12}, \text{ so Anna is more likely to lose.}$$

Turn over for the next question

Turn over ►



22

Three friends arrive at a party.

Their arrival increases the number of people at the party by 20%

In total, how many people are now at the party?

[2 marks]

20% of the original number = 3 people

100% = $3 \times 5 = 15$ people at the start

Now there are $15 + 3 = 18$ people

Answer 18



- 23 Work out the value of $(3^{12} \div 3^5) \div (3^2 \times 3)$ [3 marks]

$$3^{12} \div 3^5 = 3^{12-5} = 3^7$$

$$3^2 \times 3 = 3^{2+1} = 3^3$$

$$3^7 \div 3^3 = 3^4$$

$$3^4 = 3 \times 3 \times 3 \times 3 = 81$$

Answer 81

- 24 (a) $a + b = 0$

Which of these is equal to b ?
Circle your answer.

[1 mark]

0

$\frac{1}{a}$

a

$-a$

- 24 (b) $c \times d = 1$

Which of these is equal to d ?
Circle your answer.

[1 mark]

1

$\frac{1}{c}$

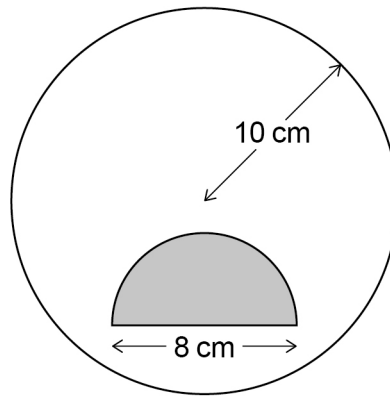
c

$-c$



25

A shaded semicircle is inside a circle as shown.

Not drawn
accuratelyThe **radius** of the circle is 10 cmThe **diameter** of the semicircle is 8 cm

How many times bigger is the unshaded area than the shaded area?

[4 marks]

$$\text{Area of circle} = \pi \times 10^2 = 100\pi$$

$$\text{Shaded semicircle: radius} = 8 \div 2 = 4 \text{ cm}$$

$$\text{Area} = \pi \times 4^2 \div 2 = 16\pi \div 2 = 8\pi$$

$$\text{Unshaded area} = 100\pi - 8\pi = 92\pi$$

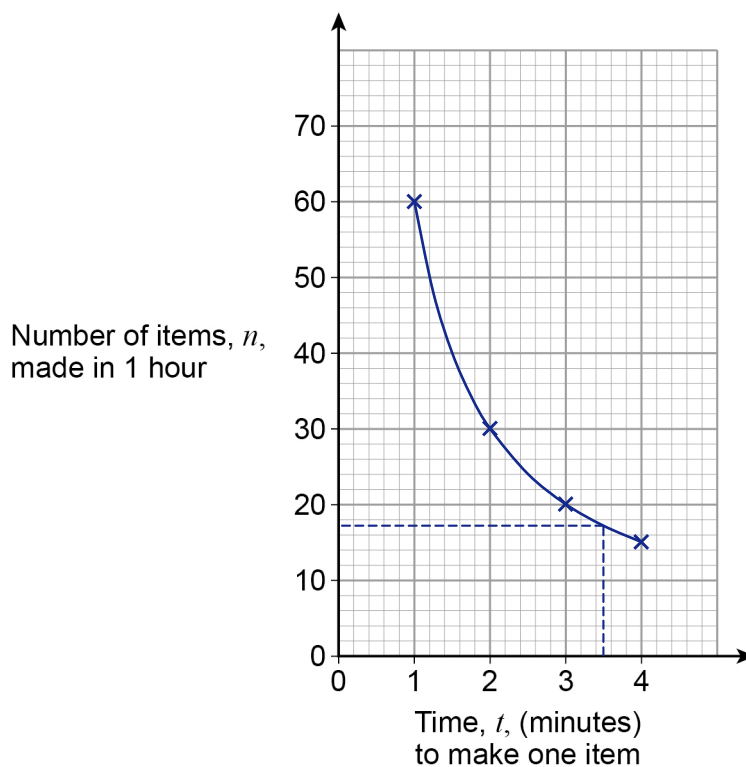
$$92\pi \div 8\pi = 92 \div 8 = 11.5$$

Answer 11.5

- 26** The number of items, n , made in 1 hour by a machine is given by $n = \frac{60}{t}$
 t is the time in minutes the machine takes to make one item.
 The value of t changes for different types of item.

- 26 (a)** On the grid below, draw the graph of $n = \frac{60}{t}$ for values of t from 1 to 4

[2 marks]



- 26 (b)** The machine takes 3 minutes 30 seconds to make one item.

Use your graph to estimate the value of n .

[2 marks]

3 minutes 30 seconds = 3.5 minutes

Answer 17



27 Rearrange $x = 2y - 6$ to make y the subject.

[2 marks]

$$x = 2y - 6$$

$$x + 6 = 2y \quad (+ 6 \text{ to both sides})$$

$$y = (x + 6) \div 2 \quad (\div 2)$$

Answer $y = \frac{x + 6}{2}$

28 Multiply out and simplify $(x + 5)(x - 1)$

[2 marks]

$$(x + 5)(x - 1) = x^2 - x + 5x - 5$$

$$= x^2 + 4x - 5$$

Answer $x^2 + 4x - 5$

END OF QUESTIONS



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2 8



1 9 6 6 8 3 0 0 / 1 F