



Please write clearly in block capitals.

Centre number Candidate number

Surname MODEL SOLUTIONS

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.



Answer all questions in the spaces provided

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

[1 mark]

right

reflex

obtuse

acute

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

$$x = \frac{8}{4} = 2$$

[1 mark]

$x = 0.5$

$x = 2$

$x = 4$

$x = 32$

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

[1 mark]

-14

-6

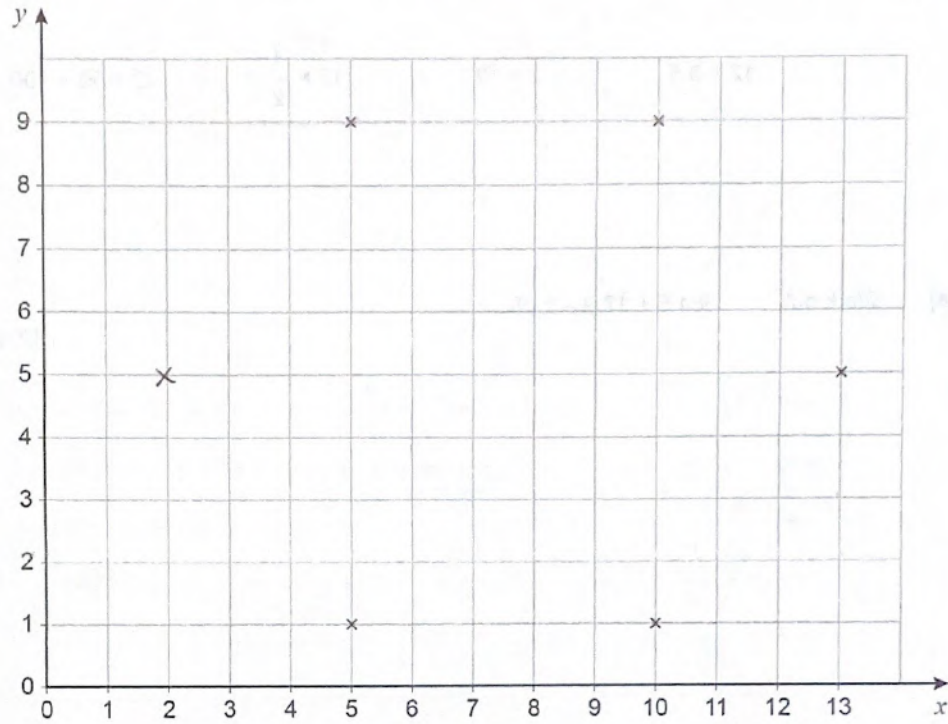
6

14



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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]

Answer (2 , 5)



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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]

$$£7 + £5 = £12$$

$$£12 + £7 = £19$$

Answer £ 19

Turn over for the next question

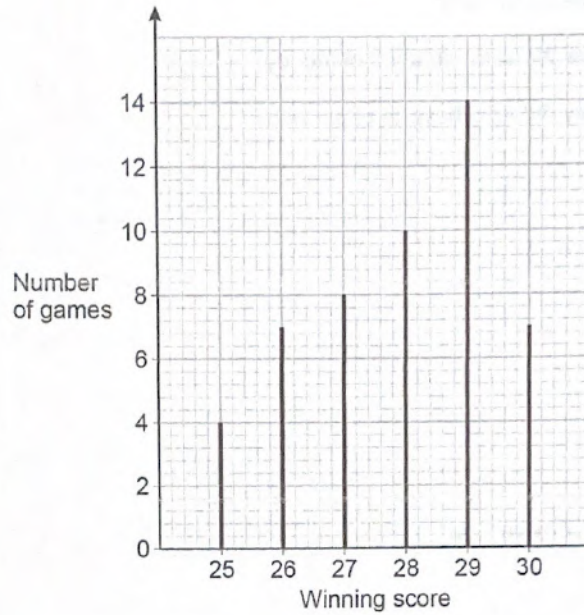
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- 8 A game is played 50 times.
The vertical line chart shows the winning scores.



- 8 (a) Write down the mode.

[1 mark]

Answer 29



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The game is played again.

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

[1 mark]

Answer $\frac{4}{50} = \frac{2}{25}$

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

[2 marks]

$8 + 10 + 14 + 7 = 39$

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]

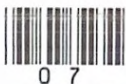
12: 12, 24, 36, 48, 60

15: 15, 30, 45, 60

Answer 60

8

Turn over ►



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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]

$$\begin{array}{r} 016.4 \\ 50 \overline{)820.0} \end{array}$$

$820 \div 50 = 16.4$, so 17 coaches are needed.

Answer 17 coaches



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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]

$$10 \times 450 = 4500$$

$$3 \times 450 = 1350$$

$$\begin{array}{r} 4500 \\ + 1350 \\ \hline 5850 \end{array}$$

Answer £ 5850

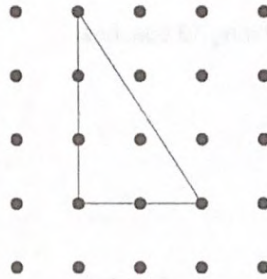
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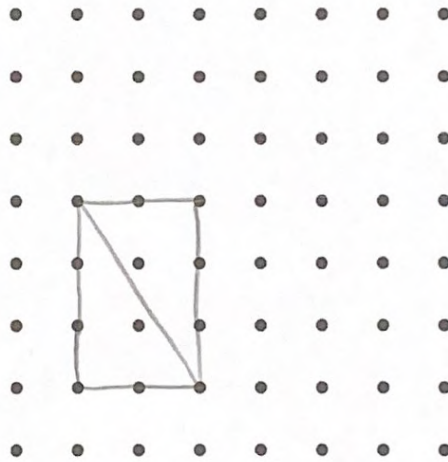
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11 Here is a triangle on a square dotted grid.



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

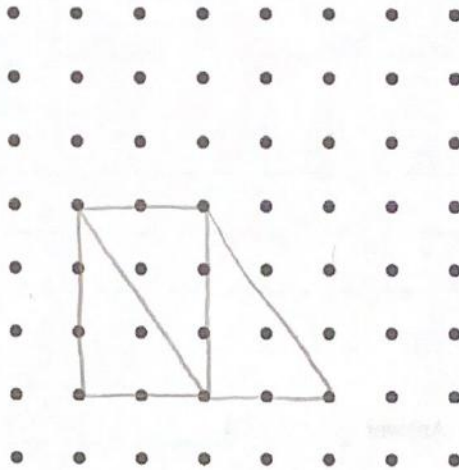
[1 mark]



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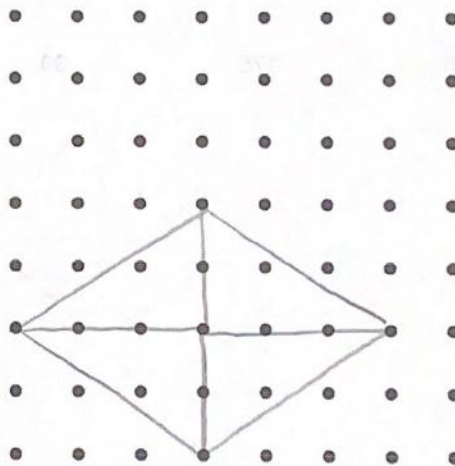
11 (b) On the grid below, show how you can make a trapezium with three of these triangles.

[1 mark]



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

[1 mark]



3

Turn over ►



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12 Work out 65% of 300

[3 marks]

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

$$5\% \text{ of } 300 = 15$$

$$(6 \times 30) + 15 = 195$$

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

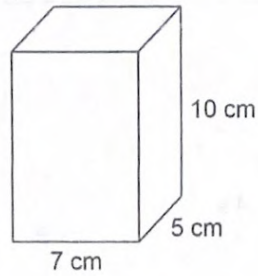
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20



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14 Here is a cuboid.



Work out the volume.

[2 marks]

$$7 \times 5 \times 10 = 350 \text{ cm}^3$$

Answer 350 cm³

15 Circle the shape that has a uniform cross section.

[1 mark]

cone

sphere

cylinder

pyramid

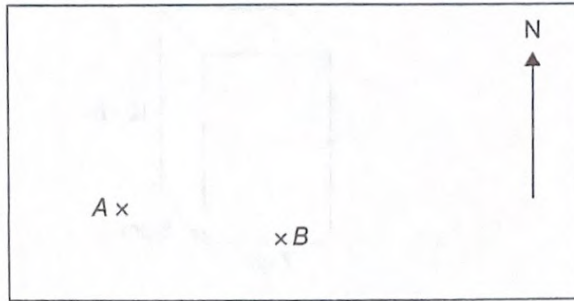
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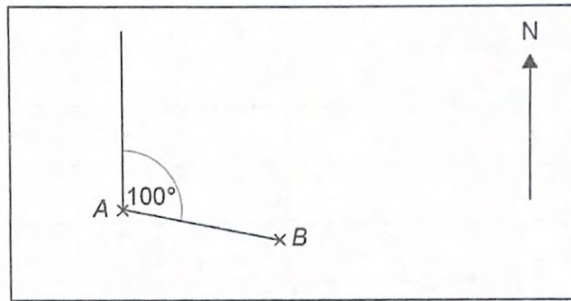
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16 (a) Here is a map showing points A and B.



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, he has given the bearing of B
from A.



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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?

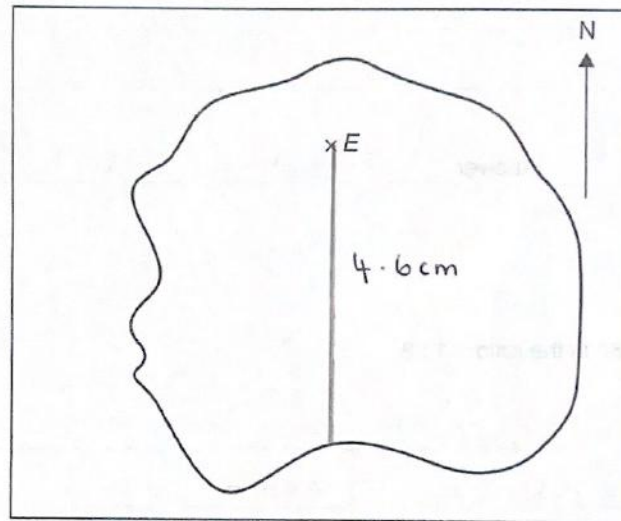
Give a reason for your answer.

[1 mark]

NO, it is North East.

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]

$$4.6 \times 100 = 460 \text{ km}$$

Answer 460 km

Turn over ►



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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]

$$5 \div 4 = 1.25$$

Answer 1.25 : 1

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

[2 marks]

$$1 + 9 = 10$$

$$£180 \div 10 = £18$$

$$£18 \times 9 = £162$$

Answer £ 18 and £ 162



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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 The average hours listened was greater for those aged 41 or over compared to 40 or under.

Comparison 2 The listening times for 41 or over was more spread out (range greater) than 40 or under.

Comparison 3 The data contained information on more over 41s than 40 or under. (79% vs 21%).

Turn over for the next question

8

Turn over ►



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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]

$$2(4a - 2b) = 2 \times 10 = 20$$

$$\Rightarrow 8a - 4b = 20$$

$$(8a - 4b) + (a + c) = 20 + 3$$

$$\Rightarrow 9a - 4b + c = 23$$

Answer $9a - 4b + c = 23$



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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]

$$\frac{3 \times 10^5}{4 \times 10^3} = \frac{3}{4} \times 10^2 = 75$$

Answer 75

Turn over for the next question

7

Turn over ►



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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.

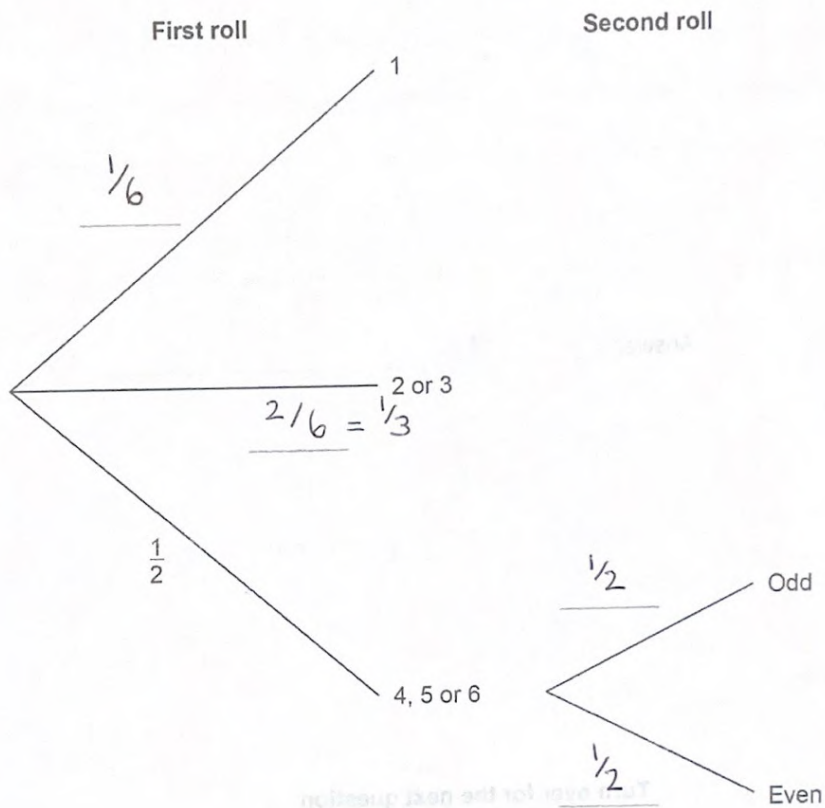
When she has to roll again,

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]

$$\text{roll } 1 = \text{win} \rightarrow \frac{1}{6}$$

$$4, 5, 6 \rightarrow \text{odd} = \text{win} \rightarrow \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

$$P(\text{Win}) = \frac{1}{6} + \frac{1}{4} = \frac{2}{12} + \frac{3}{12} = \frac{5}{12}$$

Therefore, $P(\text{Lose}) = \frac{7}{12}$, So she is more likely to lose.

Turn over for the next question

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6

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2 1

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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]

$$3 = 20\%$$

$$3 \times 5 = 15$$

$$15 + 3 = 18$$

Answer 18

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23 Work out the value of $(3^{12} \div 3^5) + (3^2 \times 3)$

[3 marks]

$$\frac{3^{12}}{3^5} \div 3^3 = 3^7 \div 3^3 = 3^4 = 81$$

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

$-c$

$\frac{7}{7}$

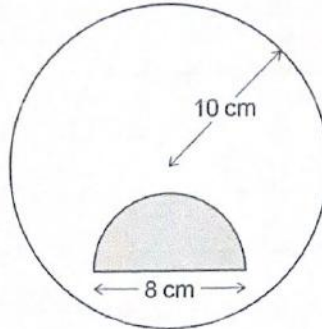
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25 A shaded semicircle is inside a circle as shown.

Not drawn accurately



The radius of the circle is 10 cm

The diameter of the semicircle is 8 cm

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

[4 marks]

$$\text{Shaded area} = \frac{1}{2} \times 4^2 \times \pi = 8\pi$$

$$\text{Circle area} = 10^2 \times \pi = 100\pi$$

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

$$92\pi \quad 8 \overline{) 92.0} \quad 11.5$$

Answer 11.5 times bigger

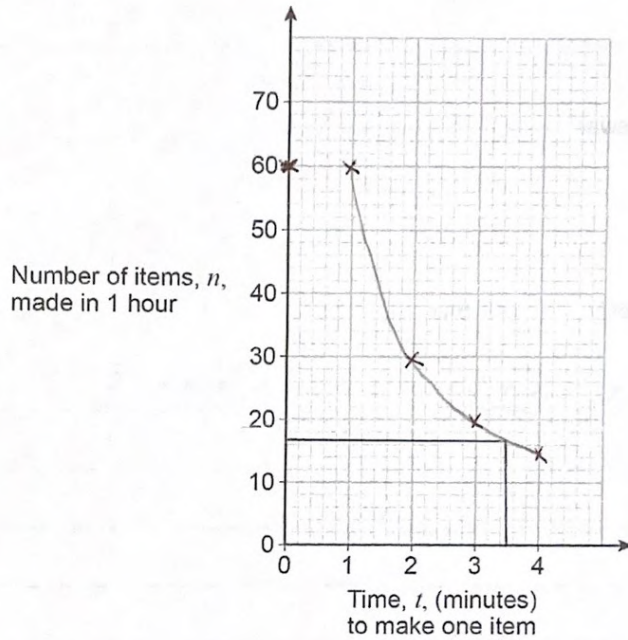


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26 The number of items, n , made in 1 hour by a machine is given by $n = \frac{60}{t}$
 t is the time in minutes the machine takes to make one item.
 The value of t changes for different types of item.

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]

Answer 17 items

8

Turn over ▶



Do not write
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box27 Rearrange $x = 2y - 6$ to make y the subject.

[2 marks]

$$x = 2y - 6$$

$$\Rightarrow x + 6 = 2y$$

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

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

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

[2 marks]

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

Answer $x^2 + 4x - 5$

END OF QUESTIONS

