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0580/33

October/November 2017

2 hours

Additional Materials: Electronic calculator Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 104.

This document consists of **16** printed pages.

- 1 (a) Martha makes hats.
Each week she makes 160 hats.

- (i) Work out how many hats she makes in 5 weeks.

..... [1]

- (ii) The hats are made in the ratio

small : medium : large = 2 : 5 : 3.

Work out how many of the 160 hats are large.

..... [2]

- (iii) She sells $\frac{3}{8}$ of the 160 hats.

Work out how many hats she sells.

..... [1]

- (b) Nina sells T-shirts.
The prices are shown in the table.

Type	Plain	Striped	Logo
Price	\$7.50	\$9.50	\$10.50

- (i) Sam buys 3 plain T-shirts and 2 logo T-shirts.

Work out how much she pays altogether.

\$ [2]

- (ii) One day, Nina reduces all prices by 20%.

Work out the new price of a striped T-shirt.

\$ [2]

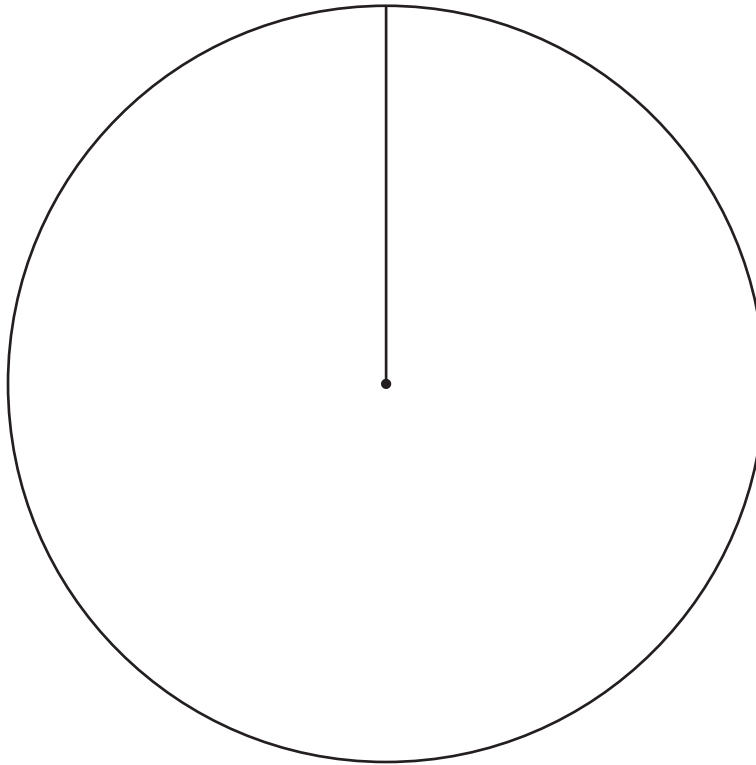
- (c) Nina sold 300 T-shirts in September.
She wants to show how many of each type she sold using a pie chart.

Type	Number sold	Pie chart sector angle
Plain	100	120°
Striped	85	
Logo	115	

- (i) Complete the table.

[2]

- (ii) Complete the pie chart.



[2]

- (d) Nina paid \$22.50 for a dress.
She sold the dress for \$31.50.

Work out her percentage profit.

..... % [3]

- 2 (a) Fill in the missing number in each calculation.

(i) $6 + 2 \times \dots\dots\dots = 24$ [1]

(ii) $(10 - \dots\dots\dots) \div 3 = 2$ [1]

- (b) Find the value of

(i) $\sqrt{1.96}$,
 [1]

(ii) 16^3 .
 [1]

- (c) Work out $\frac{7.82 - 4.15}{5.25 \times 16.4}$.

Give your answer correct to 2 significant figures.

..... [2]

(d) $V = \frac{1}{3}a^2h$

Calculate V when $a = 4.5$ and $h = 9.6$.

$V =$ [2]

- (e) Put a ring around the irrational number in the list below.

$\frac{2}{3}$ $\sqrt{5}$ $-\frac{5}{7}$ $\sqrt{36}$ $1\frac{4}{5}$ [1]

(f) Written as a product of its prime factors, $T = 2^2 \times 3 \times 5^2$.

(i) Work out the value of T .

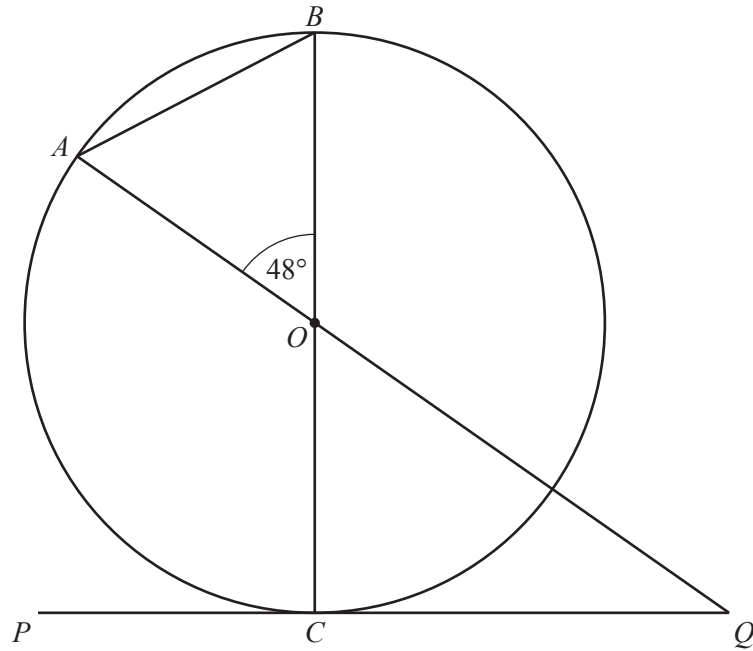
$T =$ [1]

(ii) Write 80 as a product of its prime factors.

..... [2]

(iii) Find the highest common factor (HCF) of T and 80.

..... [2]



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A , B and C are points on the circumference of the circle, centre O .
 BC is a diameter of the circle.
 PQ touches the circle at C and AOQ is a straight line.

(a) Write down the mathematical name for

(i) line AB ,

..... [1]

(ii) PQ .

..... [1]

(b) Find the size of

(i) angle COQ ,

Angle COQ = [1]

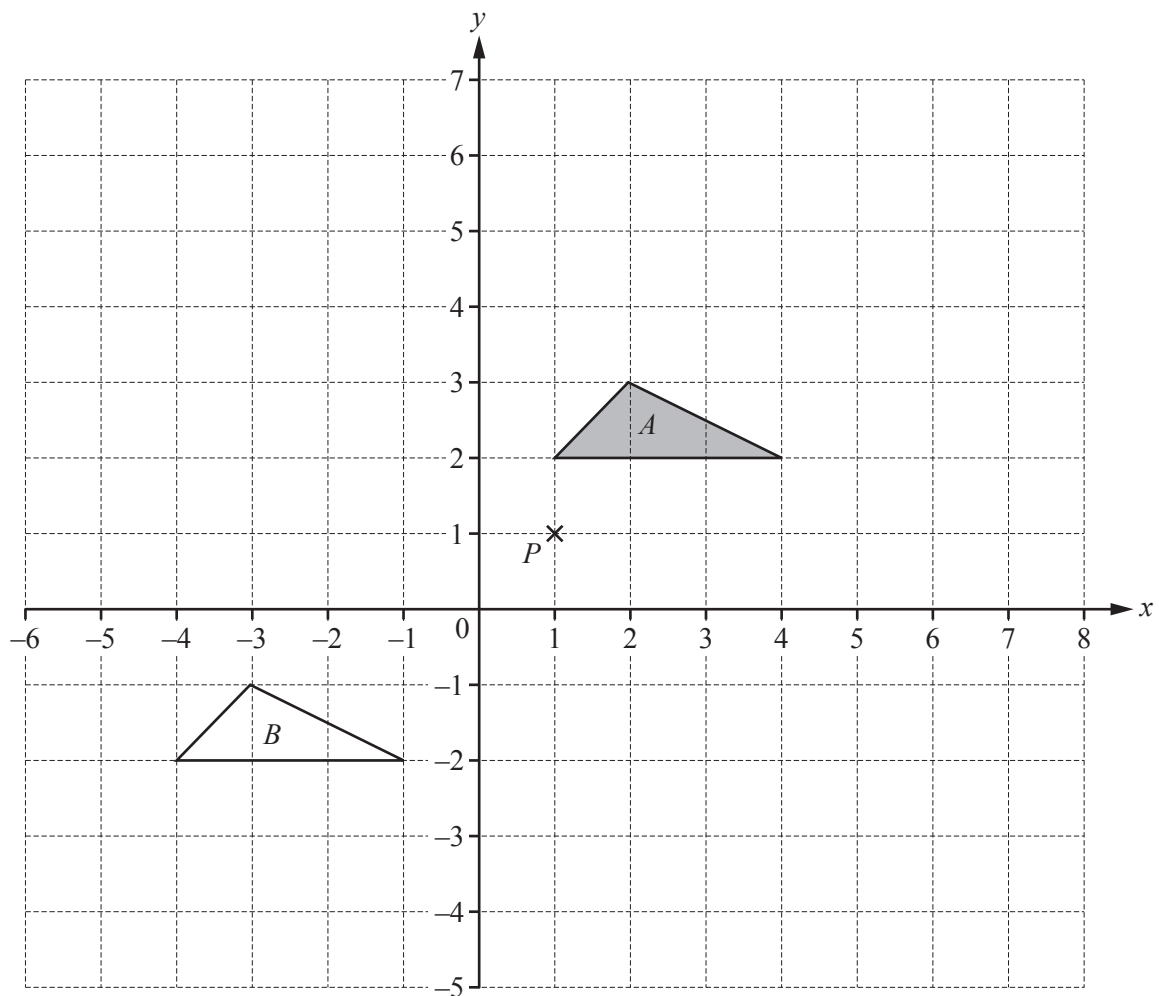
(ii) angle ABO ,

Angle ABO = [2]

(iii) angle OQC .

Angle OQC = [2]

- 4 The diagram shows two triangles A and B and point P on a 1 cm^2 grid.



- (a) Write down the mathematical name for triangle A .

..... [1]

- (b) Describe fully the **single** transformation that maps triangle A onto triangle B .

.....

..... [2]

- (c) Rotate triangle A by 90° clockwise about $(0, 0)$.

[2]

- (d) (i) Work out the area of triangle A .

..... cm^2 [1]

- (ii) Enlarge triangle A with scale factor 2 and centre P .

[2]

- (iii) Complete the statement.

The area of the enlarged triangle is times the area of triangle A .

[2]

5 (a) A small box contains n biscuits.

(i) A medium box contains 10 more biscuits than the small box.

Write an expression, in terms of n , for the number of biscuits in the medium box.

..... [1]

(ii) A large box contains twice as many biscuits as the **medium** box.

Write an expression, in terms of n , for the number of biscuits in the large box.

..... [1]

(iii) There are 52 biscuits in the large box.

Write down an equation, in terms of n , and solve it.

$n =$ [3]

(iv) Olga buys a small box and a medium box of biscuits.

How many biscuits does she have altogether?

..... [1]

- (b) In the large box, 13 of the 52 biscuits are chocolate.
Leo takes a biscuit from the box at random.

- (i) Find the probability that Leo's biscuit is chocolate.
Give your answer as a fraction in its lowest terms.

..... [2]

- (ii) On the probability scale, draw an arrow to show the probability that Leo's biscuit is **not** chocolate.



[1]

- (c) The mass of the large box of biscuits is 450 g.

Work out the total mass of 6 large boxes of biscuits.
Give your answer in kilograms.

..... kg [2]

- (d) The mass, m grams, of the small box of biscuits is 120 g, correct to the nearest 10 g.

Complete the statement about the value of m .

..... $\leq m <$ [2]

- 6 (a) Luca records the total distance, in kilometres, he walks each day for 10 days.
Here are his results.

4.7 2.4 10.3 3.6 2.3 4.3 5.1 2.6 6.9 9.6

- (i) Find the median.

..... km [2]

- (ii) Find the range.

..... km [1]

- (iii) Calculate the mean.

..... km [2]

- (b) (i) On another day, Luca walks 9 km.
He starts walking at 14 20 and he walks at an average speed of 6 km/h.

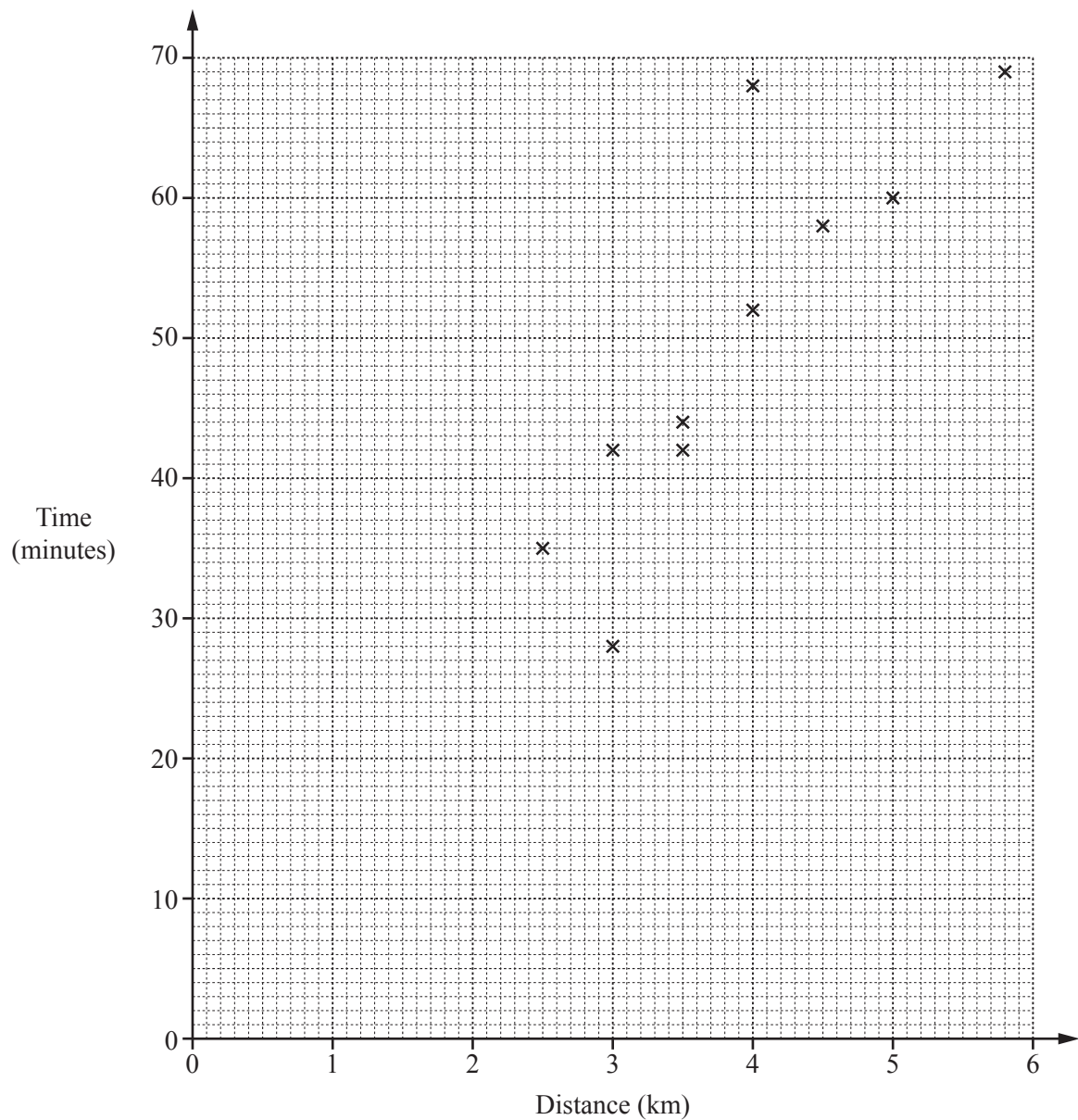
Work out the time he finishes.

..... [2]

- (ii) Convert 6 km/h to metres per minute.

.....m/min [2]

- (c) For another 10 days, Luca records the distance he walks each day and the time it takes. The scatter diagram shows this information.



- (i) What type of correlation is shown on the scatter diagram?

..... [1]

- (ii) On one of these days, Luca's average speed was much slower than on all of the other days.

Draw a ring around this point on the scatter diagram.

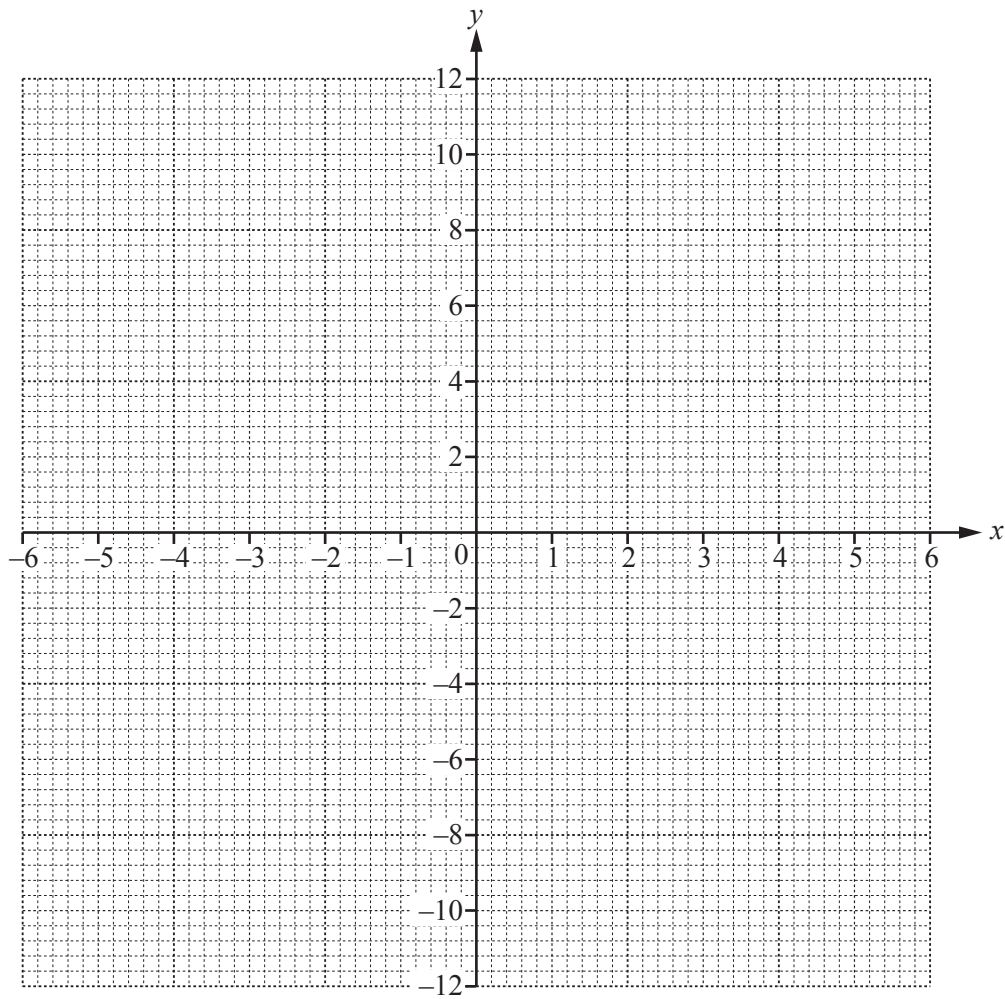
[1]

- 7 (a) (i) Complete the table of values for $y = \frac{12}{x}$.

x	-6	-4	-2	-1		1	2	4	6
y	-2			-12		12			2

[2]

- (ii) On the grid, draw the graph of $y = \frac{12}{x}$ for $-6 \leq x \leq -1$ and $1 \leq x \leq 6$.



[4]

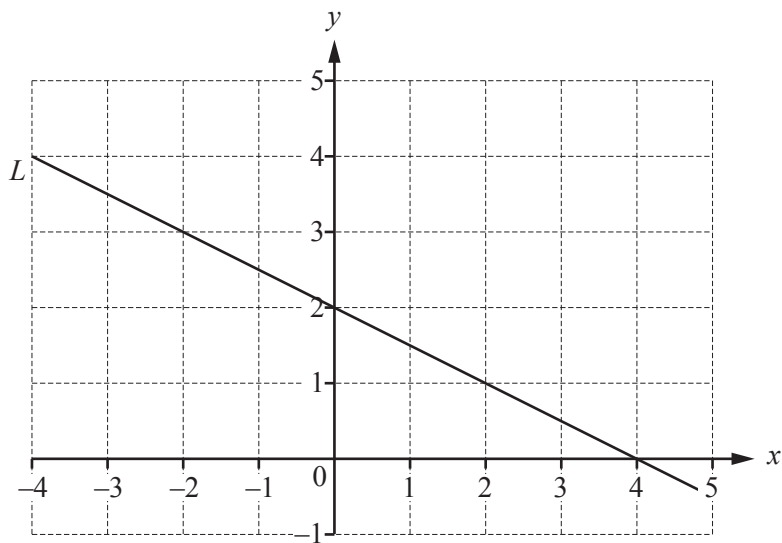
- (iii) On the grid, draw the line $y = -5$.

[1]

- (iv) Use your graph to solve the equation $\frac{12}{x} = -5$.

$x = \dots\dots\dots$ [1]

- (b) Line L is drawn on the grid.



- (i) Find the gradient of line L .

..... [2]

- (ii) Find the equation of line L in the form $y = mx + c$.

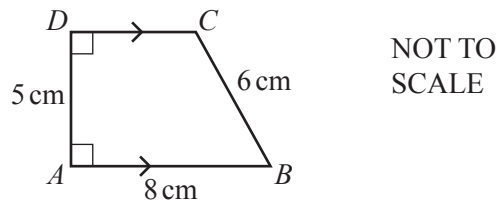
$y =$ [1]

- (iii) Line M is parallel to line L .
Line M passes through the point $(0, 3)$.

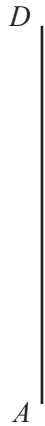
Write down the equation of line M .

$y =$ [2]

- 8 (a) The diagram shows a trapezium $ABCD$.



- (i) Draw accurately trapezium $ABCD$.
Side AD has been drawn for you.



[2]

- (ii) Measure the size of the obtuse angle.

..... [1]

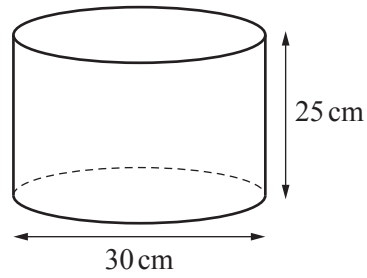
- (iii) Measure the length of CD in centimetres.

..... cm [1]

- (iv) Calculate the area of trapezium $ABCD$.

..... cm² [2]

(b)

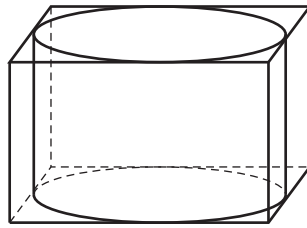
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The diagram shows a cylinder with diameter 30 cm and height 25 cm.

- (i) Calculate the volume of the cylinder.

.....cm³ [3]

- (ii) The cylinder is placed inside a cuboid.
The cylinder touches all the faces of the cuboid.

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Calculate the surface area of the cuboid.

.....cm² [3]

Question 9 is printed on the next page.

- 9 (a) Factorise.

$$y^2 + 8y$$

..... [1]

- (b) Expand the brackets and simplify.

$$3(2x - 1) - 4(x - 5)$$

..... [2]

- (c) Make p the subject of the formula $k = 5m + 7p$.

$p =$ [2]

- (d) Solve the simultaneous equations.

You must show all your working.

$$3x + 2y = 6$$

$$2x - 3y = 17$$

$x =$

$y =$ [4]

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