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0444/11

May/June 2017

**1 hour**

Additional Materials: Geometrical instruments

## READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

If work is needed for any question it must be shown in the space provided.

The total of the points for this paper is 56.

This document consists of **12** printed pages.

**Formula List**

Area,  $A$ , of triangle, base  $b$ , height  $h$ .

$$A = \frac{1}{2}bh$$

Area,  $A$ , of circle, radius  $r$ .

$$A = \pi r^2$$

Circumference,  $C$ , of circle, radius  $r$ .

$$C = 2\pi r$$

Lateral surface area,  $A$ , of cylinder of radius  $r$ , height  $h$ .

$$A = 2\pi rh$$

Surface area,  $A$ , of sphere of radius  $r$ .

$$A = 4\pi r^2$$

Volume,  $V$ , of prism, cross-sectional area  $A$ , length  $l$ .

$$V = Al$$

Volume,  $V$ , of cylinder of radius  $r$ , height  $h$ .

$$V = \pi r^2 h$$

Volume,  $V$ , of sphere of radius  $r$ .

$$V = \frac{4}{3}\pi r^3$$

- 1 Write, in figures, the number seventy thousand and twenty.

..... [1]

- 2 Write, as a fraction, the value of  $5^{-2}$ .

..... [1]

- 3 The thickness of one sheet of paper is  $5 \times 10^{-2}$  mm.

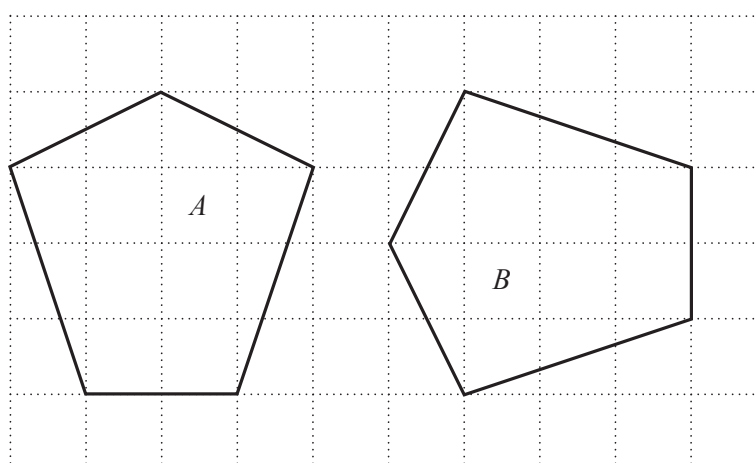
Work out the thickness of 100 sheets of paper.

..... mm [1]

- 4 Simplify.  
 $(x^2)^5$

..... [1]

5



opposite      congruent      reflected      translated

Choose the mathematical word from the list to complete this statement.

Pentagon *A* is ..... to pentagon *B*.

[1]

6                      31                      33                      35                      37                      39

From the list, write down a prime number.

..... [1]

7 Write 23.4571 correct to

(a) 4 significant digits,

..... [1]

(b) the nearest 10.

..... [1]

8 Factor completely.

$$12n^2 - 4mn$$

..... [2]

9 Find the greatest common factor (GCF) of 126 and 150.

..... [2]

- 10 The table shows the temperatures in five places at 10 am one day in January.

Place	Temperature ( $^{\circ}\text{C}$ )
Helsinki	$-7$
Chicago	$-10$
London	$3$
Moscow	$-4$
Bangkok	$26$

- (a) Which place was the coldest?

..... [1]

- (b) At 2 pm the temperature in Helsinki had increased by  $4^{\circ}\text{C}$ .

Write down the temperature in Helsinki at 2 pm.

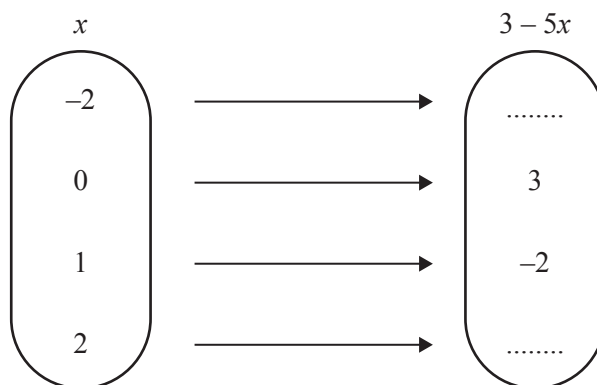
.....  $^{\circ}\text{C}$  [1]

- 11 Expand and simplify.

$$7(2x + 3y) - x(14 - y)$$

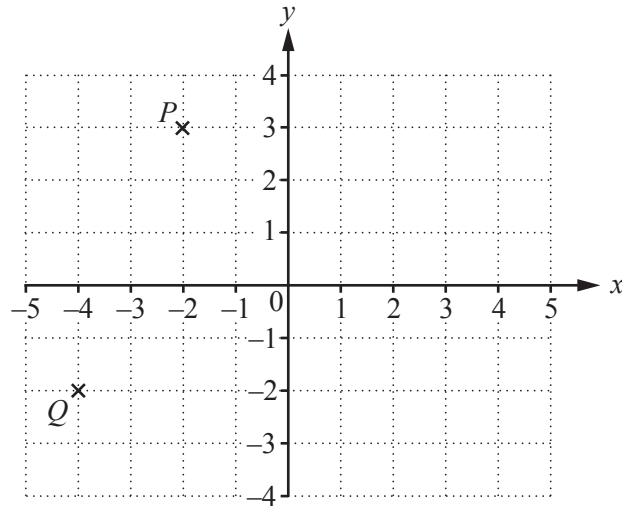
..... [2]

- 12 Complete the mapping diagram for the function  $f : x \rightarrow 3 - 5x$ .



[2]

13



- (a)  $P$  is the point  $(-2, 3)$  and  $Q$  is the point  $(-4, -2)$ .

Find  $\overrightarrow{PQ}$ .

$$\overrightarrow{PQ} = \begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix} \quad [1]$$

- (b)  $R$  is the point  $(1, -2)$  and  $\overrightarrow{RS} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ .

Find the co-ordinates of the point  $S$ .

( ..... , ..... ) [1]

- 14 Manuel changes 4500 Mexican Pesos to dollars.  
He receives \$250.

Complete this statement about the exchange rate.

\$1 = ..... Mexican Pesos [2]

- 15** Maria asks 50 students in her school when their birthday is. She records the information in the table.

	Jan to Mar	Apr to Jun	Jul to Sep	Oct to Dec
Number of birthdays	9	21	14	6

- (a)** Find the relative frequency of a student having a birthday in April, May or June.

..... [1]

- (b)** There are 500 students in the school.

Estimate the number of students who have a birthday in April, May or June.

..... [1]

- 16** Work out  $\frac{\sqrt[3]{64}}{6^2}$ .

Write your answer as a fraction in its lowest terms.

..... [2]

- 17**  $2s = t(5 + v)$

Solve for  $v$ .

$v =$  ..... [2]

- 18 (a) Work out.

$$3 + 2 \times -4$$

..... [1]

- (b) In each of these, insert one pair of brackets to make the statement correct.

(i)  $3 \times 5 + 2 + 2 = 23$  [1]

(ii)  $12 \div 4 + 2 = 2$  [1]

- 19 Work out  $1\frac{2}{3} + \frac{5}{7}$ .

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

..... [3]

- 20 Solve the system of linear equations.  
You must show all your working.

$$5x - 2y = 24$$

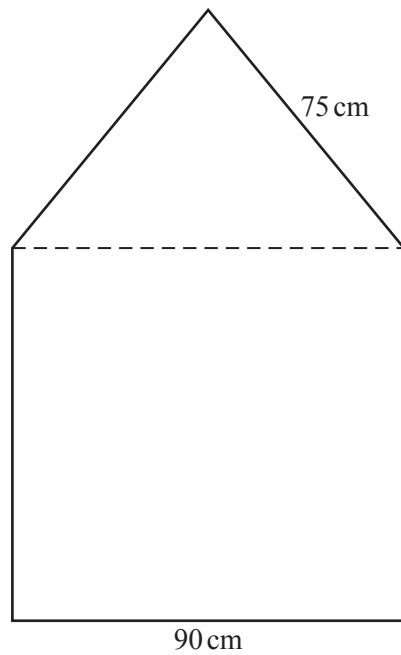
$$7x + 4y = -14$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots [3]$$



- 21 The diagram shows a notice board.



NOT TO  
SCALE

The board is in the shape of an isosceles triangle joined to a square with side 90 cm.

- (a) Work out the perimeter of the board.

..... cm [1]

- (b) The ratio height of triangle : side of square = 2 : 3.

- (i) Work out the height of the triangle.

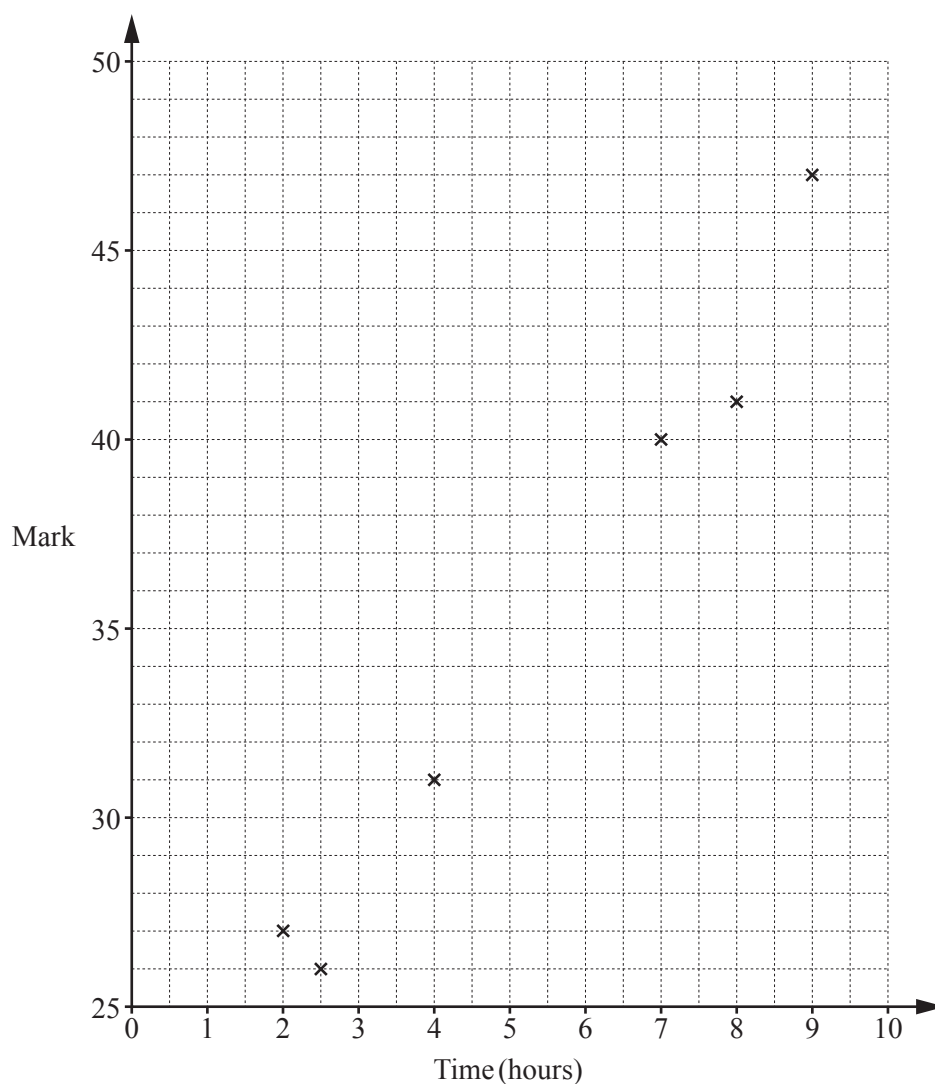
..... cm [2]

- (ii) Work out the total area of the board.  
Give your answer in square meters.

.....m<sup>2</sup> [3]

- 22 Six students revise for a test.

The scatter diagram shows the time, in hours, each student spent revising and their mark in the test.



- (a) The data for two more students is shown in the table.

Time (hours)	4.5	6.5
Mark	33	35

Plot these two points on the scatter diagram.

[1]

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

..... [1]

- (c) Draw a line of best fit on the scatter diagram.

[1]

- (d) Another student spent 5.5 hours revising.

Estimate a mark for this student.

..... [1]

23 (a)  $f(x) = x^2 - 2$

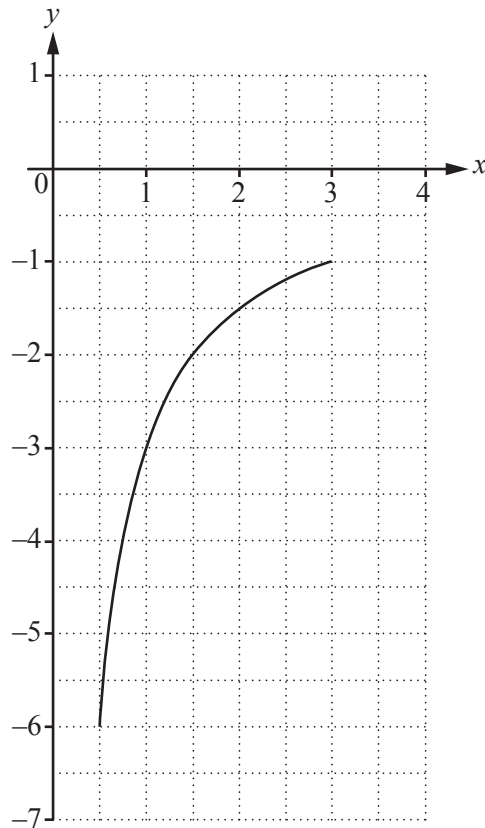
(i) Find the value of  $f(-3)$ .

..... [1]

(ii) Find  $f(7p)$  in its simplest form.

..... [1]

(b)



The diagram shows the graph of  $y = g(x)$  where  $g(x) = \frac{a}{x}$  for  $0.5 \leq x \leq b$ .  
 $a$  and  $b$  are integers.

(i) Find the value of  $a$ .

$a =$  ..... [1]

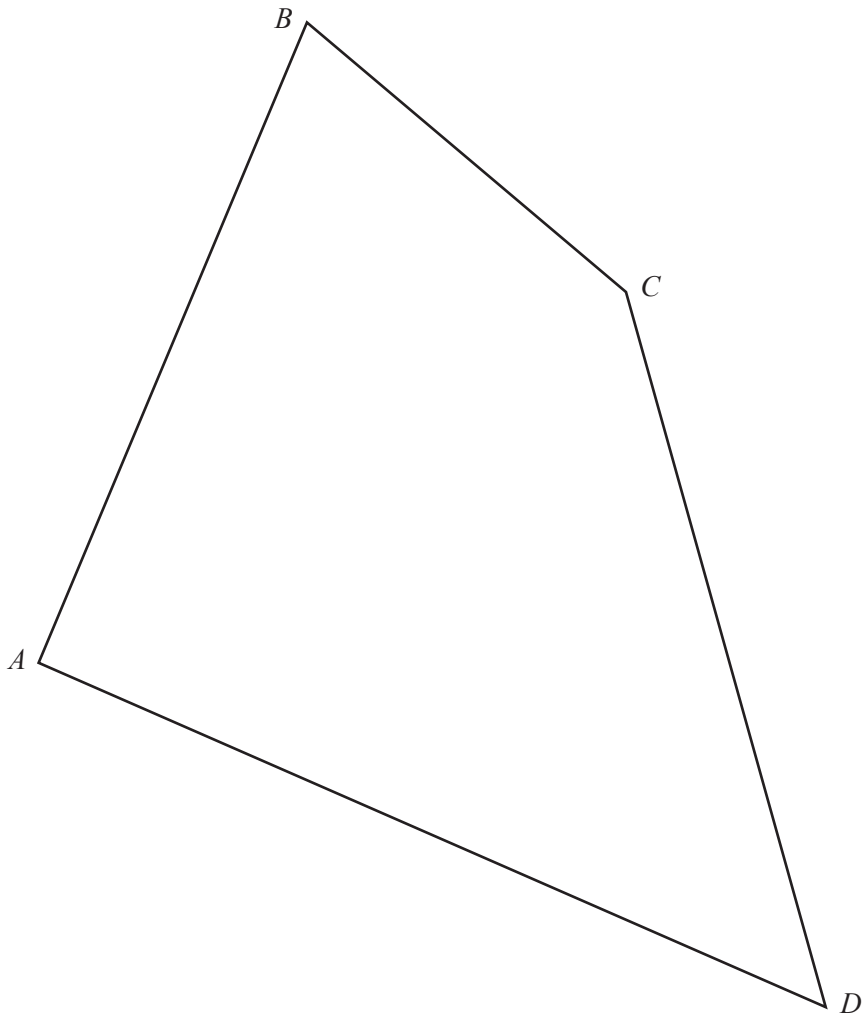
(ii) Write down the value of  $b$ .

$b =$  ..... [1]

(iii) Write down the range of  $g(x)$ .

.....  $\leq g(x) \leq$  ..... [1]

Question 24 is printed on the next page.



The diagram shows a quadrilateral  $ABCD$ .

**Using a straight edge and compass only**, construct

- (a) the perpendicular bisector of the line  $AB$ , [2]
- (b) the bisector of the angle  $ADC$ . [2]

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