



CANDIDATE  
NAME

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0444/11

**May/June 2013**

**1 hour**

**Additional Materials:** Geometrical instruments

\* 6 3 8 1 6 0 1 5 9 7 \*

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.

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UNIVERSITY of CAMBRIDGE  
International Examinations

**[Turn over**

**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 45% as a fraction in its lowest terms.

Answer ..... [1]

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- 2 One January day in Munich, the temperature at noon was  $3^{\circ}\text{C}$ .  
At midnight the temperature was  $-8^{\circ}\text{C}$ .

Write down the difference between these two temperatures.

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

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- 3 Simplify  $\sqrt{49} - 4^2$ .

Answer ..... [2]

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- 4 Pedro and Eva do their homework.  
Pedro takes 84 minutes to do his homework.

The ratio Pedro's time : Eva's time = 7 : 6.

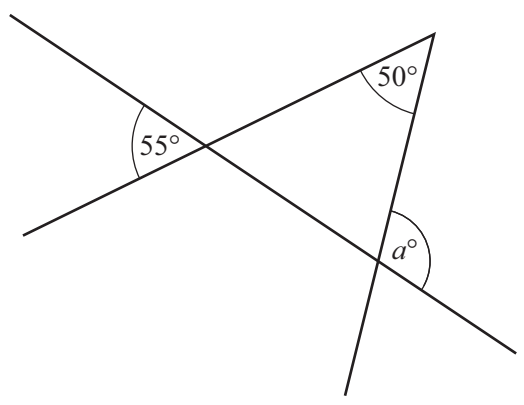
Work out the number of minutes Eva takes to do her homework.

Answer ..... min [2]

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4

5



NOT TO  
SCALE

Use the information in the diagram to find the value of  $a$ .

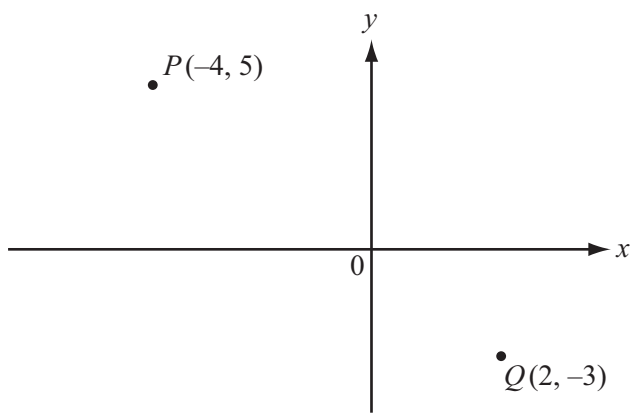
Answer  $a =$  ..... [2]

6 Simplify  $1\frac{1}{2} \div \frac{3}{16}$ .

Answer ..... [2]

7

5



NOT TO  
SCALE

Peter is standing at P  $(-4, 5)$  and Quentin's house is at Q  $(2, -3)$ .

(a) Write down  $\vec{PQ}$  in vector form.

Answer(a)  $\begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$  [2]

(b) Peter walks directly towards Quentin's house until he is at the midpoint of  $PQ$ .  
He then stops for a rest.

Work out the co-ordinates of the point at which Peter stops.

Answer(b) (..... , ..... ) [1]

8 Solve for  $b$ .

$$a = \frac{b}{5} - 9$$

Answer  $b =$  ..... [2]

- 9 Here are the first four terms of a sequence.

4      11      18      25

Write down

- (a) the next term of the sequence,

Answer(a) ..... [1]

- (b) an expression for the  $n$ th term.

Answer(b) ..... [2]

- 10  $x$  and  $y$  are integers.

- (a) Find the value of  $x$  when  $-7 < x < -5$ .

Answer(a)  $x =$  ..... [1]

- (b) Find the value of  $y$  when  $\frac{3}{4} < \frac{y}{16} < \frac{7}{8}$ .

Answer(b)  $y =$  ..... [2]

- 11 The probability of Sachin's team winning any match is 0.45.

- (a) Write down the probability of Sachin's team **not** winning any match.

Answer(a) ..... [1]

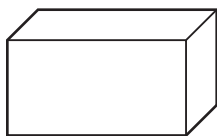
- (b) In a season there are 40 matches.

How many matches should Sachin's team expect to win in a season?

Answer(b) ..... [2]

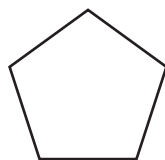
12 Complete each statement with the correct mathematical term.

(a)



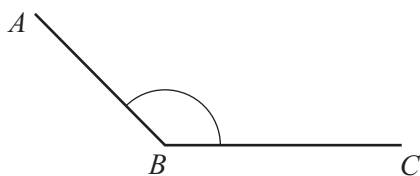
This solid is a ..... [1]

(b)



This polygon is a regular ..... [1]

(c)



Angle  $ABC$  is an ..... angle [1]

13 (a) The perimeter of a square is 28 mm.

Work out the length of one side of the square.

Answer(a) ..... mm [1]

(b) A prism has cross-sectional area  $7.5 \text{ cm}^2$  and length 5 cm.

Work out the volume of the prism, giving the units of your answer.

Answer(b) ..... [2]

- 14 Bruce invested \$400 at a rate of 4% per year compound interest.

Work out the amount of **interest** Bruce has after 2 years.

Answer \$ ..... [3]

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- 15 One day, the exchange rate between the euro (€) and the Swiss franc (CHF) was €1 = CHF1.10 .

- (a) Lars changed €50 into Swiss francs.

Work out how much Lars received.

Answer(a) CHF ..... [1]

- (b) Martina changed CHF220 into euros.

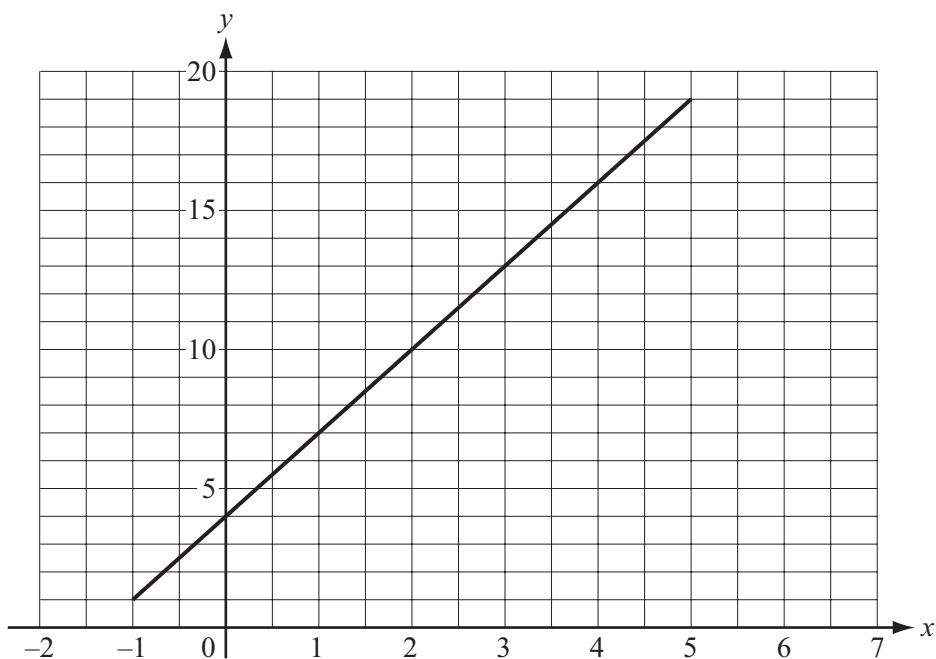
Work out how much Martina received.

Answer(b) € ..... [2]

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16



The diagram shows the graph of  $y = f(x)$  for  $p \leq x \leq q$ .

- (a) (i) Write down the values of  $p$  and  $q$ .

Answer(a)(i)  $p =$  .....

$q =$  ..... [1]

- (ii) Write down the range of  $f(x)$ .

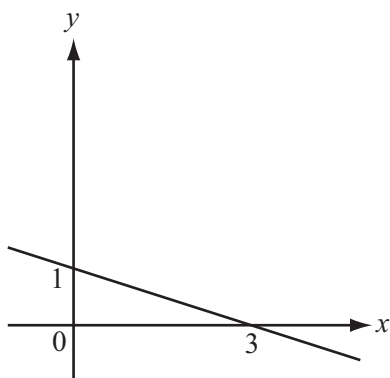
Answer(a)(ii) ..... [1]

- (b) The graph can be used to work out how many children are allowed in a kindergarten. There are  $x$  adults, where  $x$  is at most 4.

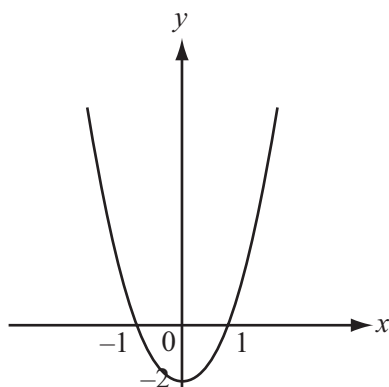
Write down an appropriate domain for  $f(x)$  in these circumstances.

Answer(b) ..... [1]

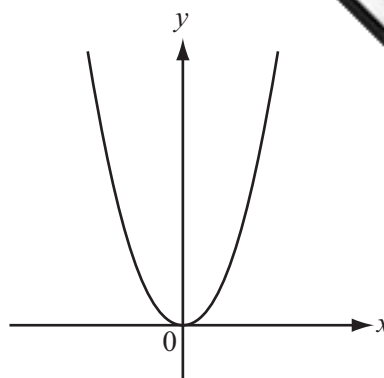
17 The diagrams A, B, C, D, E and F are the graphs of six functions.



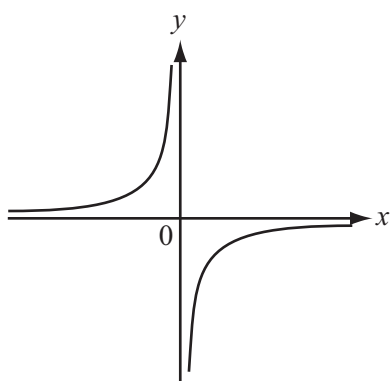
A



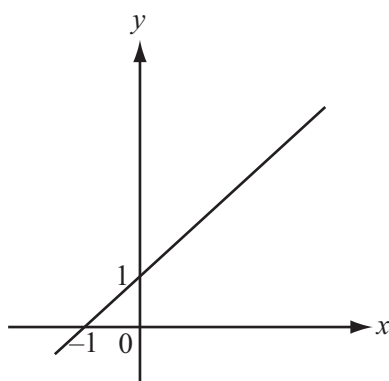
B



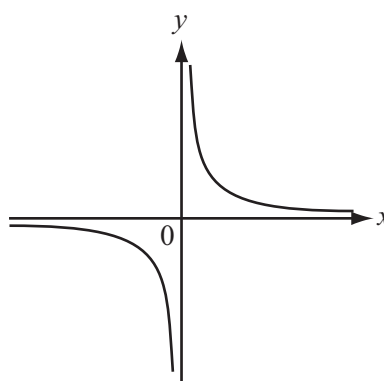
C



D



E



F

(a) Complete the table to show which diagrams represent the given functions.

Function	$y = 1 - \frac{x}{3}$	$y = 2x^2$	$y = -\frac{4}{x}$
Diagram	A		

[2]

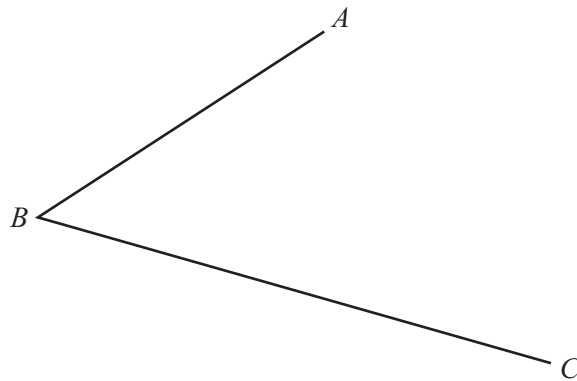
(b) The function in diagram C is  $y = f(x)$  and the function in diagram B is  $y = f(x) + k$ .

Write down the value of  $k$ .

Answer(b) ..... [1]

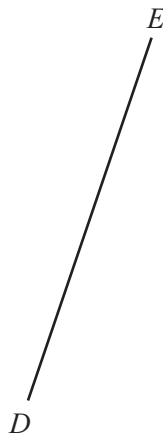
- 18 In this question use a straight edge and compass only.  
Leave in all your construction arcs.

(a) Construct the bisector of angle  $ABC$ .



[2]

(b) Construct the perpendicular bisector of the line  $DE$ .



[2]

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Questions 19 and 20 are printed on the next page.

19 (a) Write  $5^{-2}$  as a fraction.

Answer(a) ..... [1]

(b) Write  $\left(\frac{1}{2}\right)^2$  as a decimal.

Answer(b) ..... [1]

(c) Simplify.

(i)  $a^6 \times a^3$

Answer(c)(i) ..... [1]

(ii)  $24b^{16} \div 6b^4$

Answer(c)(ii) ..... [2]

20 (a) Expand the parentheses.

$$5(x + 3)$$

Answer(a) ..... [1]

(b) Factor completely.

$$12xy - 3x^2$$

Answer(b) ..... [2]

(c) Solve.

$$5x - 24 = 51$$

Answer(c)  $x =$  ..... [2]

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