



1 Write down a prime number between 50 and 60.

..... [1]

2 Use your calculator to work out  $\sqrt{1 - (\sin 33^\circ)^2}$ .

..... [1]

3 Write the recurring decimal  $0.\dot{7}$  as a fraction.

..... [1]

4 Complete each statement.

(a) A quadrilateral with only one pair of parallel sides is called a ..... [1]

(b) An angle greater than  $90^\circ$  but less than  $180^\circ$  is called ..... [1]

5 The distance between Prague and Vienna is 254 kilometres.  
The local time in Prague is the same as the local time in Vienna.  
A train leaves Prague at 15 20 and arrives in Vienna at 19 50 the same day.

Calculate the average speed of the train.

..... km/h [2]

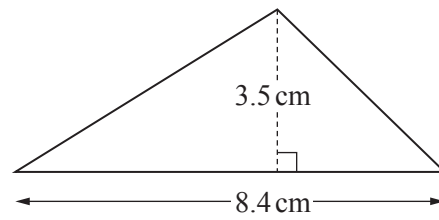
6 Solve the equation.

$$9f + 11 = 3f + 23$$

$f =$  ..... [2]

3

7

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Calculate the area of this triangle.

..... cm<sup>2</sup> [2]

8 (a) Write 0.047 883 correct to 2 significant figures.

..... [1]

(b) Write 0.005 27 in standard form.

..... [1]

9 Find the highest common factor (HCF) of 90 and 48.

..... [2]

10 On a map with scale 1 : 25 000, the area of a lake is 33.6 square centimetres.

Calculate the actual area of the lake, giving your answer in square kilometres.

..... km<sup>2</sup> [2]

11 Find the matrix that represents a rotation about  $(0, 0)$  through  $90^\circ$  clockwise.

$$\left( \begin{array}{cc} & \\ & \end{array} \right) \quad [2]$$

12 Simplify.

(a)  $5m^2 \times 2m^3$

..... [2]

(b)  $(x^8)^3$

..... [1]

13 Without using a calculator, work out  $2\frac{1}{4} \div \frac{3}{7}$ .

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

- 14 Solve the simultaneous equations.  
You must show all your working.

$$5x + 8y = 4$$

$$\frac{1}{2}x + 3y = 7$$

$x = \dots\dots\dots$

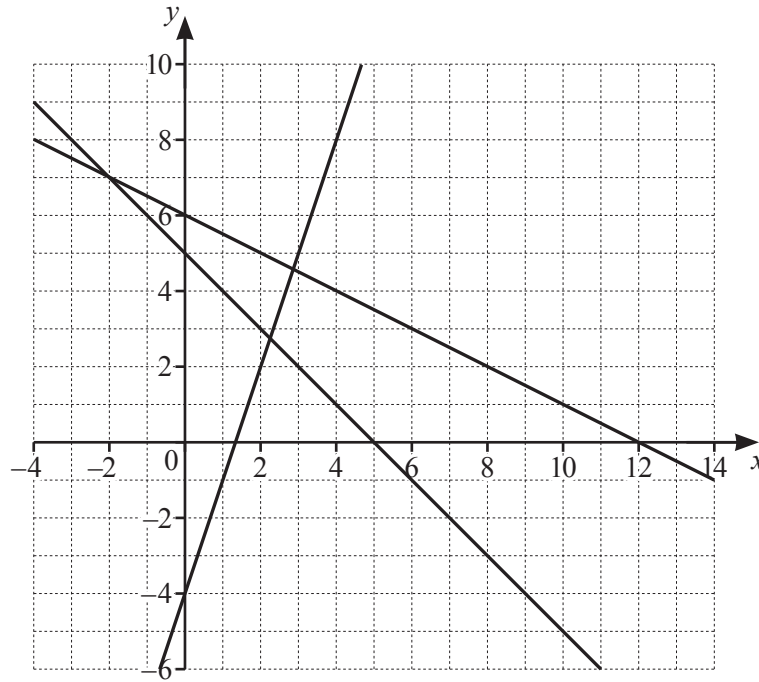
$y = \dots\dots\dots [3]$

- 15 Shona buys a chair in a sale for \$435.60 .  
This is a reduction of 12% on the original price.

Calculate the original price of the chair.

$\$ \dots\dots\dots [3]$

16



$$y \leq -\frac{1}{2}x + 6 \quad y \geq 3x - 4 \quad x + y \geq 5$$

- (a) By shading the **unwanted** regions of the grid, find and label the region  $R$  that satisfies the three inequalities. [2]
- (b) Find the largest value of  $x + y$  in the region  $R$ , where  $x$  and  $y$  are integers.

..... [1]

17 Write as a single fraction in its simplest form.

$$1 - \frac{2x}{x+3} + \frac{x+3}{x-5}$$

..... [3]

- 18 The table shows the number of people in different age groups at a cinema.

Age ( $y$ years)	$15 < y \leq 25$	$25 < y \leq 30$	$30 < y \leq 50$	$50 < y \leq 80$
Number of people	35	32	44	12

Dexter draws a histogram to show this information.

The height of the bar he draws for the group  $15 < y \leq 25$  is 7 cm.

Calculate the height of each of the remaining bars.

$25 < y \leq 30$  ..... cm

$30 < y \leq 50$  ..... cm

$50 < y \leq 80$  ..... cm [3]

19 Rearrange this formula to make  $m$  the subject.

$$P = \sqrt{\frac{k+m}{m}}$$

$$m = \dots\dots\dots [4]$$

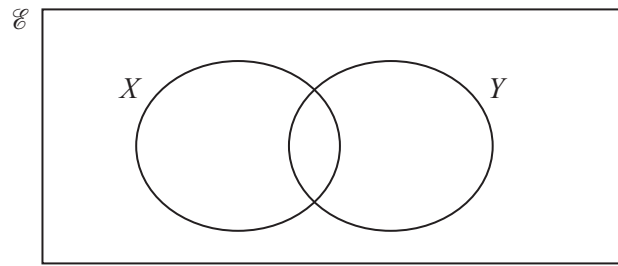
20 Solve the equation  $3x^2 - 2x - 10 = 0$ .

Show all your working and give your answers correct to 2 decimal places.

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots [4]$$

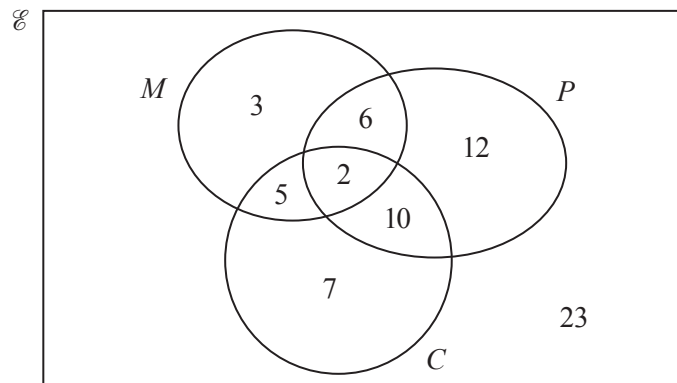


21 (a) In the Venn diagram, shade  $X \cup Y'$ .



[1]

(b) The Venn diagram below shows information about the number of gardeners who grow melons ( $M$ ), potatoes ( $P$ ) and carrots ( $C$ ).



(i) A gardener is chosen at random from the gardeners who grow melons or potatoes or both.  
Find the probability that this gardener does not grow carrots.

..... [2]

(ii) Find  $n((M \cap P) \cup C')$ .

..... [1]

22       $\mathbf{A} = \begin{pmatrix} 3 & 4 \\ 0 & 1 \end{pmatrix}$        $\mathbf{B} = \begin{pmatrix} 3 & -4 \end{pmatrix}$

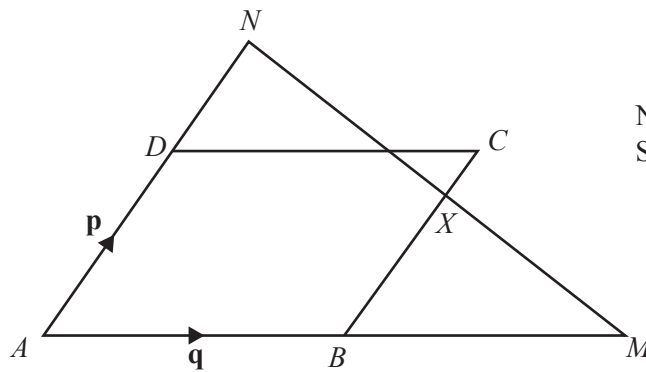
(a) Find  $\mathbf{A}^{-1}$ , the inverse of  $\mathbf{A}$ .

..... [2]

(b) Calculate  $\mathbf{BA}$ .

..... [2]

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$ABCD$  is a parallelogram with  $\overrightarrow{AB} = \mathbf{q}$  and  $\overrightarrow{AD} = \mathbf{p}$ .  
 $ABM$  is a straight line with  $AB : BM = 1 : 1$ .  
 $ADN$  is a straight line with  $AD : DN = 3 : 2$ .

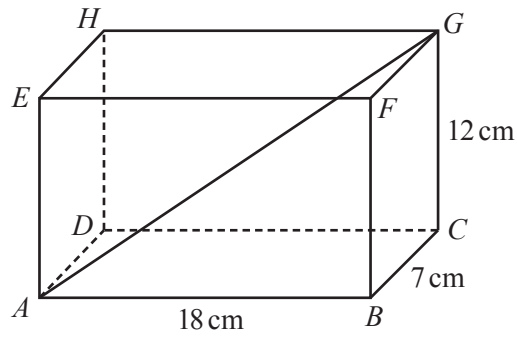
(a) Write  $\overrightarrow{MN}$ , in terms of  $\mathbf{p}$  and  $\mathbf{q}$ , in its simplest form.

$\overrightarrow{MN} =$  ..... [2]

(b) The straight line  $NM$  cuts  $BC$  at  $X$ .  
 $X$  is the midpoint of  $MN$ .  
 $\overrightarrow{BX} = k\mathbf{p}$

Find the value of  $k$ .

$k =$  ..... [2]



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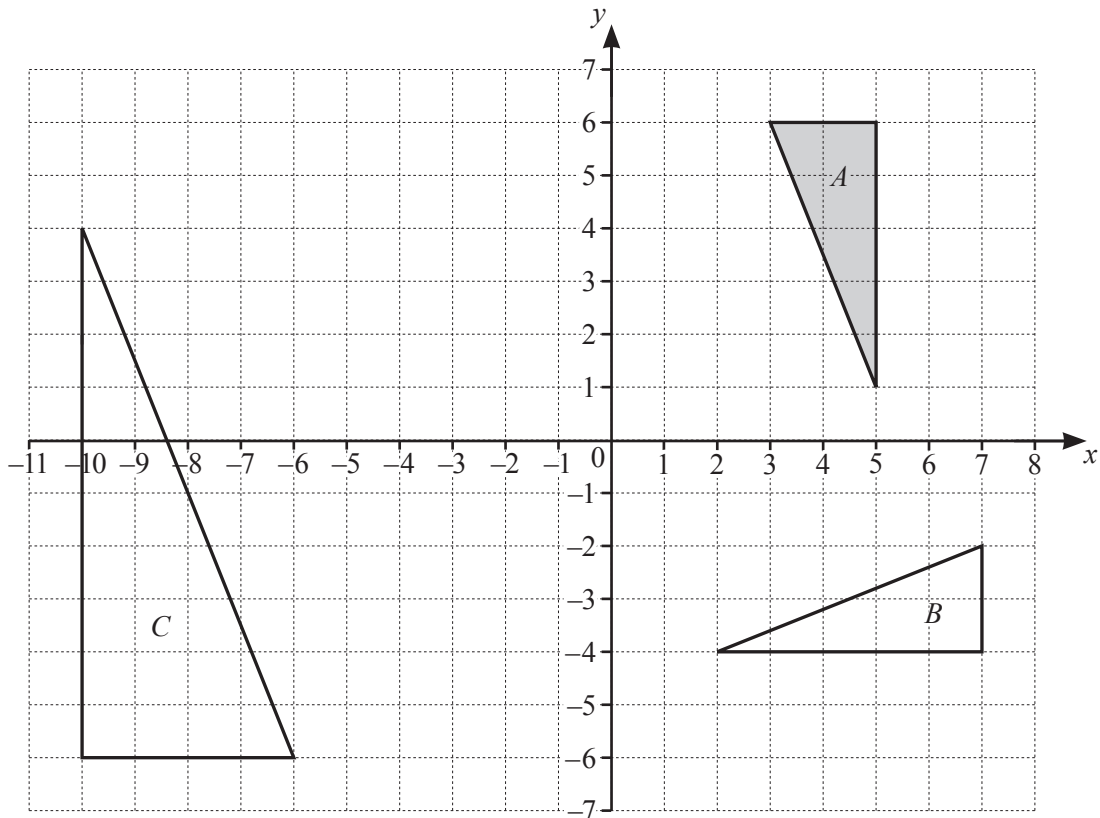
$ABCDEFGH$  is a cuboid.

$AB = 18$  cm,  $BC = 7$  cm and  $CG = 12$  cm.

Calculate the angle that the diagonal  $AG$  makes with the face  $BCGF$ .

..... [4]

**Question 25 is printed on the next page.**



Describe fully the **single** transformation that maps

- (a) triangle *A* onto triangle *B*,

.....  
 ..... [3]

- (b) triangle *A* onto triangle *C*.

.....  
 ..... [3]

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