



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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MATHEMATICS

0580/11

Paper 1 (Core)

May/June 2012

1 hour

Candidates answer on the Question Paper.

Additional Materials:

Electronic calculator

Geometrical instruments

Mathematical tables (optional)

Tracing paper (optional)

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Answer **all** questions.

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For π , use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total of the marks for this paper is 56.

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

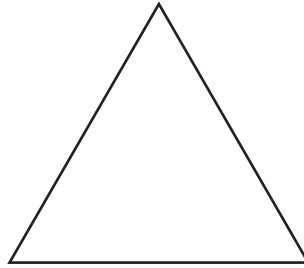


- 1 Kyle scores 84 marks out of 96 in an examination.

Work out his percentage mark.

Answer % [1]

2



The lengths of each side of this triangle are the same.

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

Answer(a) [1]

- (b) Write down the number of lines of symmetry for the triangle.

Answer(b) [1]

- 3 Work out the number of minutes from 18 27 on Tuesday to 03 19 on Wednesday.

Answer min [2]

- 4 Gregor changes \$700 into euros (€) when the rate is €1 = \$1.4131 .

Calculate the amount he receives.

Answer € [2]

- 5 $w = 3a - 5b$

Calculate w when $a = 2$ and $b = -3$.

Answer $w =$ [2]

- 6 One bracelet costs 85 cents and one necklace costs \$7.50 .

Write down an expression, **in dollars**, for the total cost of b bracelets and n necklaces.

Answer \$ [2]

For
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Use

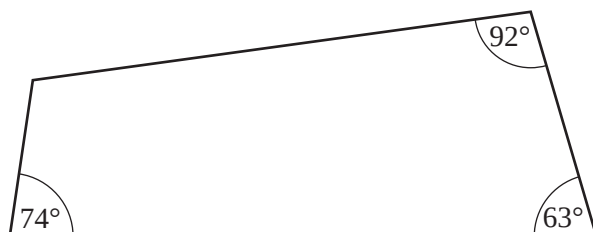
- 7 (a) A quadrilateral has four sides of equal length and two pairs of equal angles.

Write down the mathematical name for this quadrilateral.

For
Examiner's
Use

Answer(a) [1]

(b)



NOT TO
SCALE

Three of the angles in a quadrilateral are 63° , 74° and 92° .

Work out the size of the fourth angle.

Answer(b) [1]

- 8 Solve the equation $4x - 2 = 7$.

Answer $x =$ [2]

- 9 The temperature at the top of a mountain is -12°C .
The temperature at the bottom of the mountain is 18°C .

(a) Work out the difference in these temperatures.

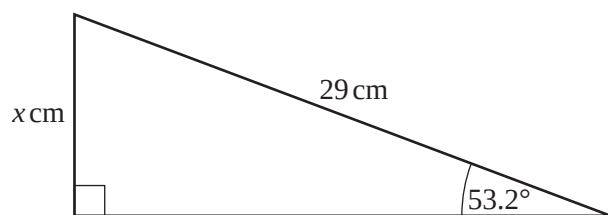
Answer(a) $^\circ\text{C}$ [1]

(b) 18°C is given correct to the nearest degree.

Write down the upper bound for this temperature.

Answer(b) $^\circ\text{C}$ [1]

10

NOT TO
SCALE

Calculate the value of x .

Answer $x =$ [2]

11 (a) Write down all the factors of 15.

Answer(a) [1]

(b) Factorise completely.

$$15p^2 + 24pt$$

Answer(b) [2]

12 Triangle ABC has sides $AB = 40$ m, $BC = 25$ m and $AC = 35$ m.

Using a scale of 1 cm to represent 5 m, construct triangle ABC .

The construction must be completed using a ruler and compasses only.

All construction arcs must be clearly shown.

Answer

A B

[3]

- 13 Shania invests \$750 at a rate of $2\frac{1}{2}\%$ per year simple interest.
Calculate the **total** amount Shania has after 5 years.

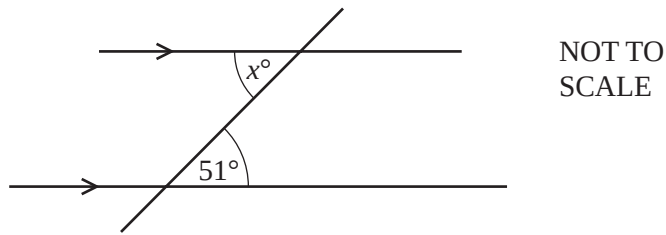
Answer \$ [3]

- 14 Without using your calculator, work out $1\frac{5}{6} + \frac{9}{10}$.

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

Answer [3]

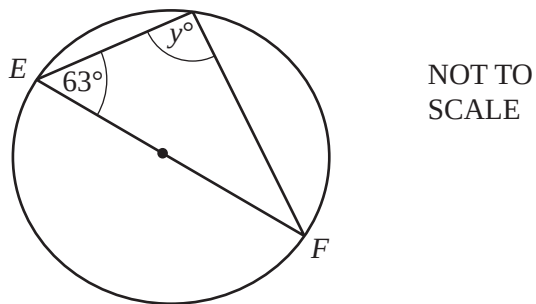
- 15 (a) Find the value of x .



Answer(a) $x =$ [1]

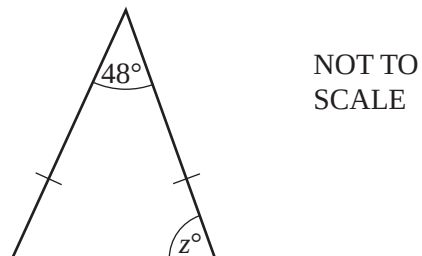
- (b) EF is a diameter of the circle.

Find the value of y .



Answer(b) $y =$ [1]

- (c) Find the value of z in this isosceles triangle.



Answer(c) $z =$ [1]

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16 Solve the simultaneous equations.

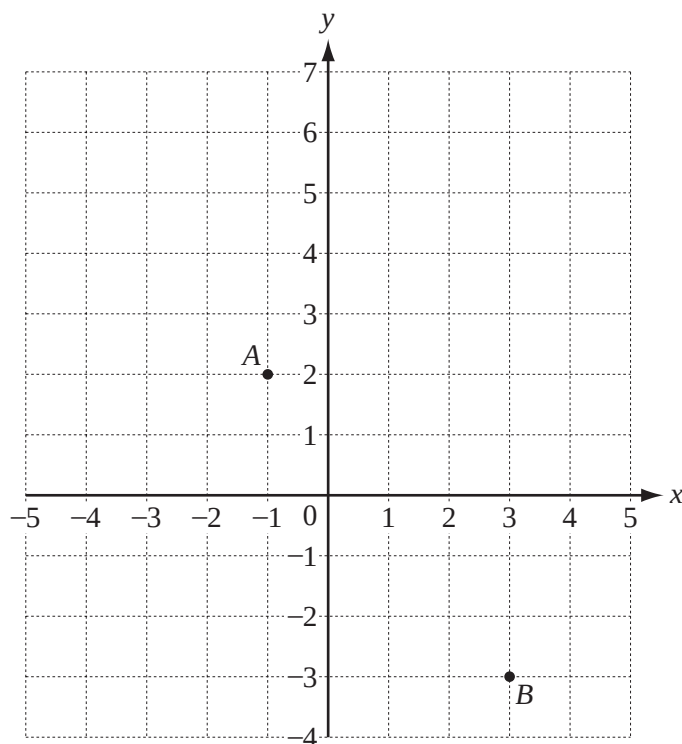
$$3x + 5y = 24$$

$$x + 7y = 56$$

For
Examiner's
Use

Answer $x =$

$y =$ [3]



- (a) Write down the co-ordinates of point A .

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

- (b) Write $\vec{AB}$ as a column vector.

Answer(b) $\vec{AB} = \begin{pmatrix} \\ \end{pmatrix}$ [1]

- (c) $\vec{AC} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$

Write down the co-ordinates of C .

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

- 18 (a) Write 326.413 correct to 2 significant figures.

Answer(a) [1]

- (b) Find the square root of one million.

Answer(b) [2]

- (c) Calculate

$$\frac{64.3 + 7.465}{5.2 - 3.65}.$$

Answer(c) [1]

- 19 (a) Simplify

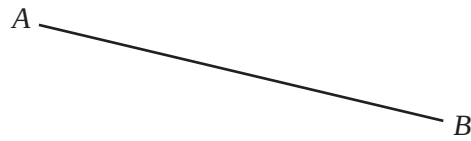
$$4p + 3q + 5p - 7q.$$

Answer(a) [2]

- (b) Make x the subject of this formula.

$$g = 2x + y$$

Answer(b) $x =$ [2]



- (a) **Using a straight edge and compasses only**, construct the perpendicular bisector of AB .
Show all your construction arcs. [2]
- (b) Draw the locus of points that are 4 cm from A . [1]
- (c) Shade the region which is less than 4 cm from A and nearer to B than to A . [1]
-

Question 21 is printed on the next page.

21

13 17 13 17 19 13 31 21 29

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Use

(a) For the numbers above, find

(i) the range,

Answer(a)(i) [1]

(ii) the median.

Answer(a)(ii) [2]

(b) Write down the only number in the list which is **not** a prime number.

Answer(b) [1]

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- 1 Work out the value of $\frac{48}{19.1 - 3.5 \times 4.6}$.

Answer [1]

- 2 Write the following in order of size, starting with the smallest.

0.83 $\frac{5}{6}$ 82% $\frac{23}{28}$

Answer < < < [2]

- 3 The ferry from Helsinki to Travemunde leaves Helsinki at 17 30 on a Tuesday.
The journey takes 28 hours 45 minutes.

Work out the day and time that the ferry arrives in Travemunde.

Answer Day Time [2]

4 TRIGONOMETRY

From the above word, write down the letters which have

- (a) exactly two lines of symmetry,

Answer(a) [1]

- (b) rotational symmetry of order 2.

Answer(b) [1]

- 5 The table shows the average monthly temperatures in Beijing.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average temperature ($^{\circ}\text{C}$)	-4.6	-2.2	4.5	13.1	19.8	24.0	25.8	24.4	19.4	12.4	4.1	-2.7

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- (a) Work out how many degrees higher the temperature is in December than in January.

Answer(a) $^{\circ}\text{C}$ [1]

- (b) Find the range.

Answer(b) $^{\circ}\text{C}$ [1]

6 $\mathbf{a} = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} -2 \\ 7 \end{pmatrix}$

Work out $3\mathbf{a} + \mathbf{b}$.

Answer $\begin{pmatrix} \\ \end{pmatrix}$ [2]

7

$$1\frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{p}{12}$$

Work out the value of p .

Show all your working.

Answer $p =$ [2]

- 8 A lake has an area of 63 800 000 000 square metres.

Write this area in square kilometres, correct to 2 significant figures.

Answer km² [2]

- 9 (a) Simplify $a^{-3} \times a^8$.

Answer(a) [1]

- (b) Work out the value of 5^{-2} .

Answer(b) [1]

- 10 The number of people, n , who attended a concert was 12 600 to the nearest 100.

Complete the statement about n .

Answer $\leq n <$ [2]

- 11 Keiko travels from Tokyo to London for the Olympic Games.
On the internet, a flight costs £767.

- (a) Use the exchange rate £1 = 143 Japanese Yen to find the cost of the flight in Japanese Yen.

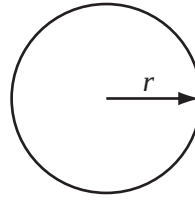
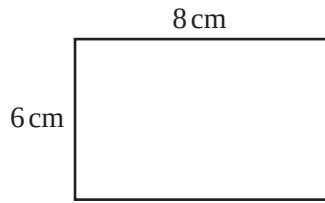
Answer(a) Yen [1]

- (b) Write your answer to **part (a)** in standard form.

Answer(b) [1]

For
Examiner's
Use

12

NOT TO
SCALEFor
Examiner's
Use

The perimeter of the rectangle is the same length as the circumference of the circle.

Calculate the radius, r , of the circle.

Answer $r =$ cm [3]

13 (a) Factorise $xy - y^2$.

Answer(a) [1]

(b) Solve $4x - 7 = 12$.

Answer(b) $x =$ [2]

- 14** Scatter diagrams are drawn to compare sets of data from each team in a hockey league during a year.

Write down the type of correlation you would expect to see when the data recorded is

- (a)** the number of games won and the total points scored,

Answer(a) [1]

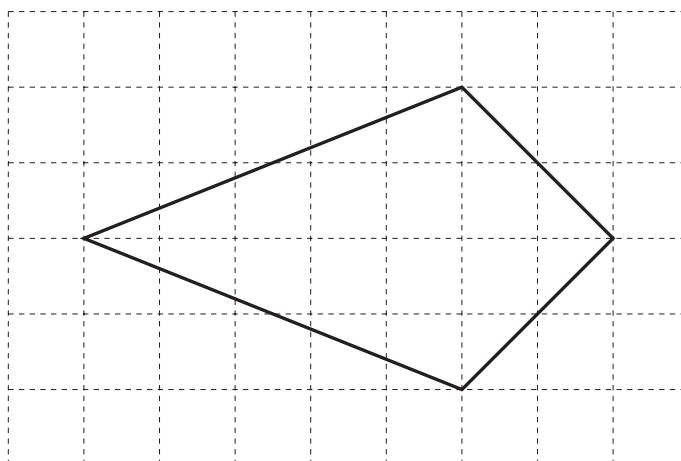
- (b)** the number of games drawn and the average height of the team,

Answer(b) [1]

- (c)** the number of goals scored and the final position in the league.

Answer(c) [1]

15



The diagram shows a quadrilateral drawn on a 1 cm square grid.

- (a)** Write down the mathematical name of the quadrilateral.

Answer(a) [1]

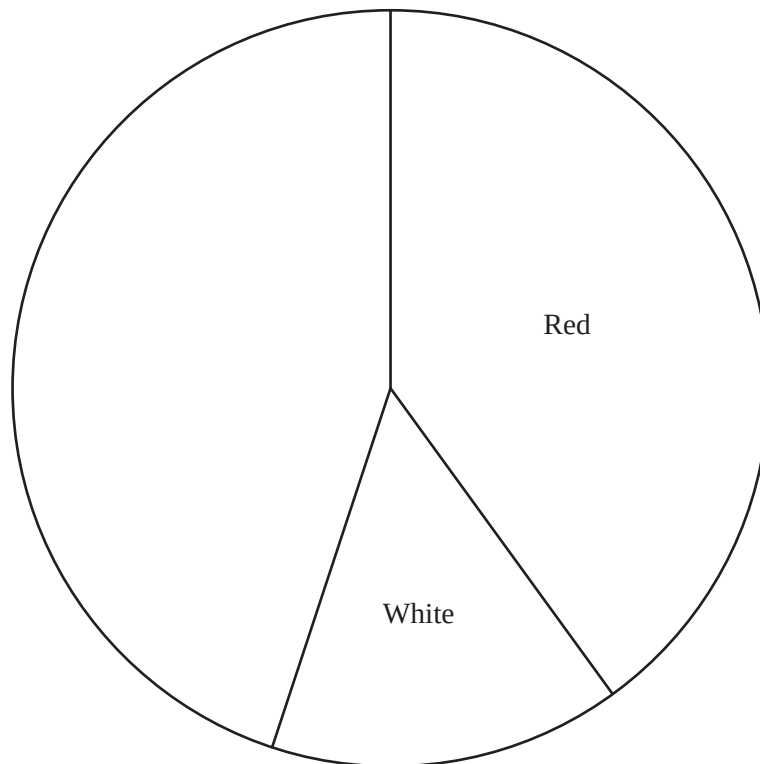
- (b)** Find the area of the quadrilateral and give the units.

Answer(b) [2]

- 16 The shirt colour of the teams in a football league are shown in the following table.

Colour	Frequency
Red	8
White	3
Blue	7
Gold	2

The pie chart shows some of this information.
The sectors for red shirts and white shirts have been drawn.



- (a) Calculate the angle of the sector for blue shirts.

Answer(a) [2]

- (b) Complete the pie chart. [1]

17 Solve the simultaneous equations.

$$\begin{aligned} 6x + 2y &= 22 \\ 4x - y &= 3 \end{aligned}$$

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Answer $x =$
 $y =$ [3]

18 The taxi fare in a city is \$3 **and** then \$0.40 for every kilometre travelled.

(a) A taxi fare is \$9.

How far has the taxi travelled?

Answer(a) km [2]

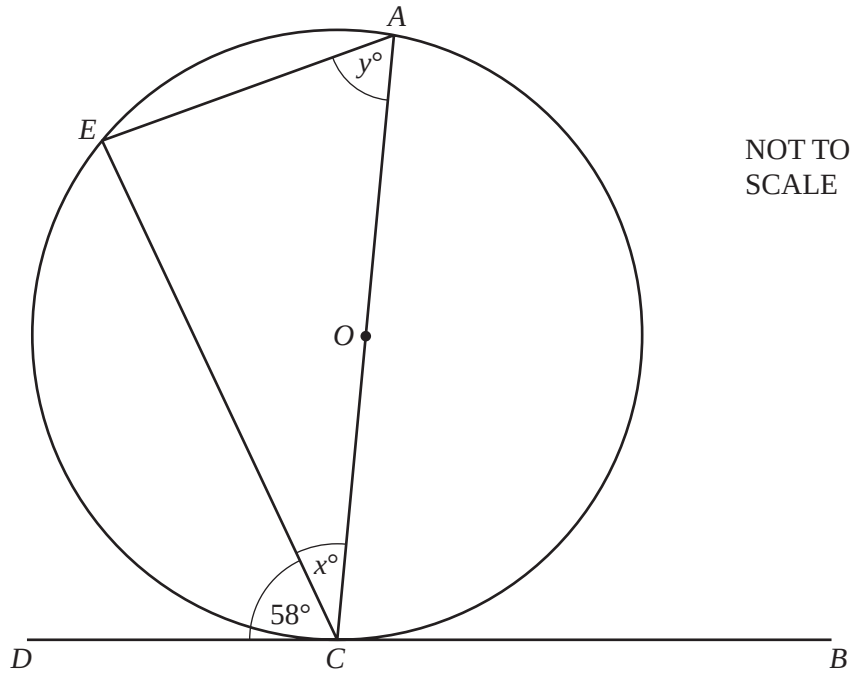
(b) Taxi fares cost 30% more at night.

How much does a \$9 daytime journey cost at night?

Answer(b) \$ [2]

19

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AC is a diameter of a circle, centre O .
 BCD is a tangent to the circle and E is a point on the circumference.
 Angle $ECD = 58^\circ$.

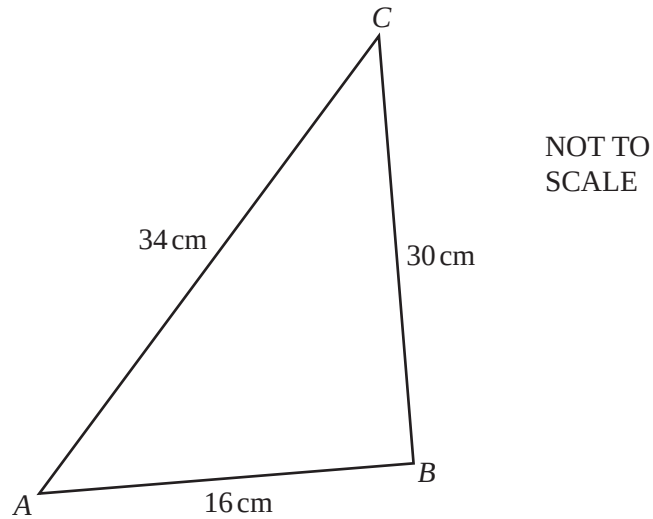
Work out the value of

(a) x ,

Answer(a) $x = \dots\dots\dots$ [2]

(b) y .

Answer(b) $y = \dots\dots\dots$ [2]



- (a) Write down all your working to show that angle ABC is a right angle.

Answer(a)

[2]

- (b) Use trigonometry to calculate angle CAB .

Answer(b) Angle $CAB = \dots\dots\dots$ [2]

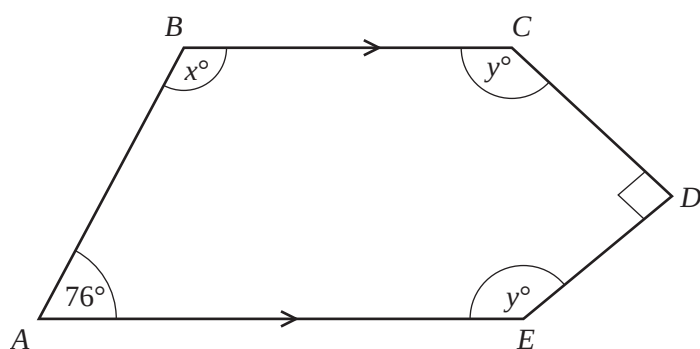
- 21 (a) Show that the sum of the interior angles of a regular pentagon is 540° .

Answer(a)

For
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Use

[2]

(b)



NOT TO
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The diagram shows a pentagon $ABCDE$.
 BC is parallel to AE and angle CDE is a right angle.

Find the values of x and y .

Answer(b) $x =$

$y =$ [3]

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- 1 Write $\frac{2}{5}$ as a percentage.

Answer % [1]

- 2 Change 5.2 square metres into square centimetres.

Answer cm^2 [1]

- 3 Mohinder changes \$240 into Rupees.
The exchange rate is \$1 = 46.2875 Rupees.

Calculate how many Rupees he receives.

Answer Rupees [1]

- 4 (a) Write down the next prime number after 47.

Answer(a) [1]

- (b) Write down the next square number after 49.

Answer(b) [1]

5 < > =

Choose one of these symbols to make each statement correct.

(a) -15 -5 [1]

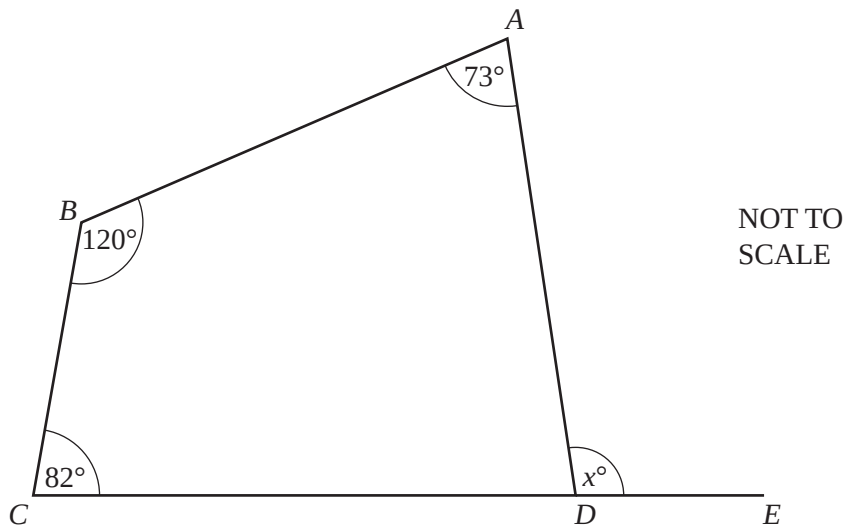
(b) $(-5)^2$ 25 [1]

6 Hans invests \$750 for 8 years at a rate of 2% per year simple interest.

Calculate the interest Hans receives.

Answer \$ [2]

7



The diagram shows a quadrilateral $ABCD$.
 CDE is a straight line.

Calculate the value of x .

Answer $x =$ [2]

For
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Use

8 Work out

(a) $\begin{pmatrix} 5 \\ 3 \end{pmatrix} - \begin{pmatrix} 6 \\ -2 \end{pmatrix},$

Answer(a) $\begin{pmatrix} \\ \end{pmatrix}$ [1]

(b) $5 \begin{pmatrix} 3 \\ -4 \end{pmatrix}.$

Answer(b) $\begin{pmatrix} \\ \end{pmatrix}$ [1]

9 Simplify

(a) $a^0,$

Answer(a) [1]

(b) $b^3 \times b^{-5}.$

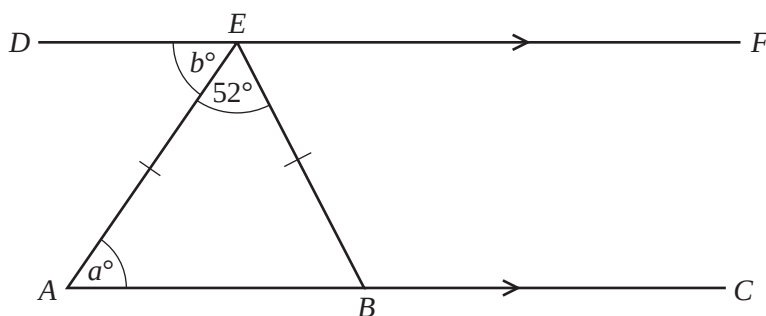
Answer(b) [1]

- 10 During her holiday, Hannah rents a bike.
She pays a fixed cost of \$8 and then a cost of \$4.50 per day.
Hannah pays with a \$50 note and receives \$10.50 change.

Calculate for how many days Hannah rents the bike.

Answer days [3]

11

NOT TO
SCALE

In the diagram lines AC and DF are parallel and $AE = EB$.
Angle $AEB = 52^\circ$.

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

Answer(a) [1]

- (b) Work out the value of a .

Answer(b) $a =$ [1]

- (c) Explain why $a = b$.

Answer(c) [1]

- 12 Solve the simultaneous equations.

$$4x + y = 18$$

$$5x + 3y = 19$$

Answer $x =$

$y =$ [3]

For
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Use

13 (a) Write 0.000 64 in standard form.

Answer(a) [1]

(b) Calculate, writing the answer in standard form.

$$\frac{8.18 \times 10^7}{5.84 \times 10^4}$$

Answer(b) [2]

14

7	3	8	2	5	1
5	3	4	6	2	3

For the numbers above work out the

(a) mode,

Answer(a) [1]

(b) median,

Answer(b) [2]

(c) range.

Answer(c) [1]

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Use

- 15 Without using your calculator, work out the following.**
Show all the steps of your working and give each answer as a fraction in its simplest form.

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(a) $\frac{11}{12} - \frac{1}{3}$

Answer(a) [2]

(b) $\frac{1}{4} \div \frac{11}{13}$

Answer(b) [2]

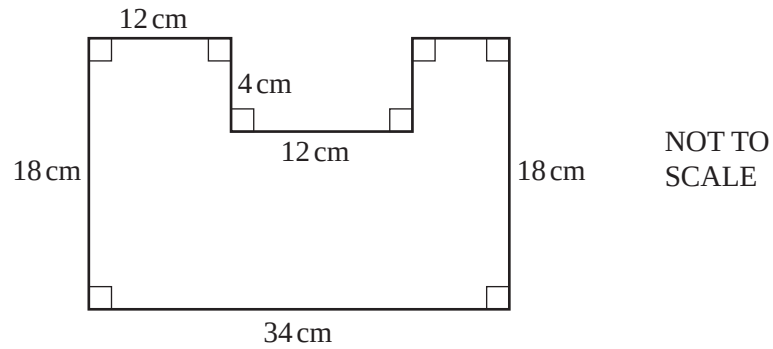
- 16 (a)** Solve the equation $5(x - 3) = 21$.

Answer(a) $x =$ [2]

- (b)** Make x the subject of the equation $y = 3x - 2$.

Answer(b) $x =$ [2]

17



For the shape above, work out

(a) the perimeter,

Answer(a) cm [2]

(b) the area.

Answer(b) cm² [2]

18 (a) Find the value of $7p - 3q$ when $p = 8$ and $q = -5$.

Answer(a) [2]

(b) Factorise completely.

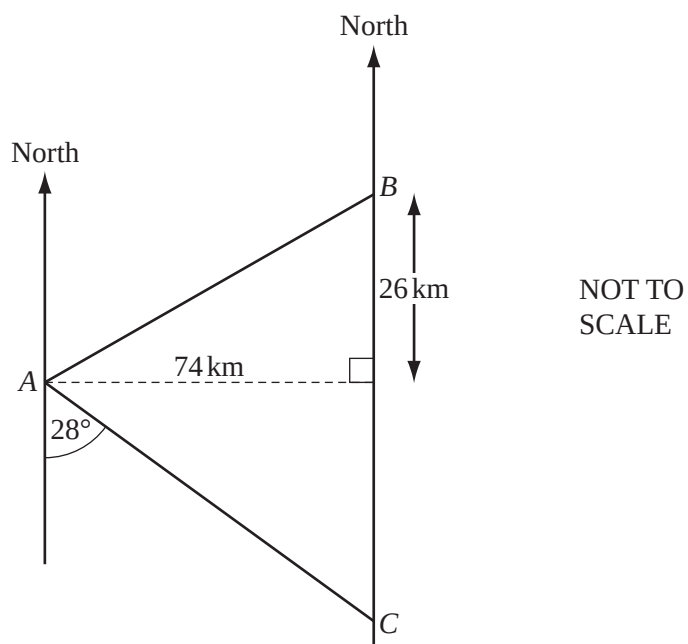
$$3uv + 9vw$$

Answer(b) [2]

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Use

19

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Use



- (a) Work out the bearing of A from C .

Answer(a) [2]

- (b) Calculate the distance AB .

Answer(b) km [2]

- 20 (a) Colin has some seeds.
The probability a seed will grow is 0.85.

Find the probability that a seed will **not** grow.

Answer(a) [1]

- (b) Richard grows flowers.
Some of his flowers are chosen at random.
The colours are recorded in the table below.

Colour of flower	Frequency	Relative Frequency
Red	20	0.16
Blue	15	
Yellow	35	
Other	55	

- (i) Complete the table to show the relative frequency of each colour. [2]

- (ii) Richard grows 800 flowers in total.

Estimate how many of these flowers are red.

Answer(b)(ii) [2]

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