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0580/11

October/November 2011

1 hour

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

READ THESE INSTRUCTIONS FIRST

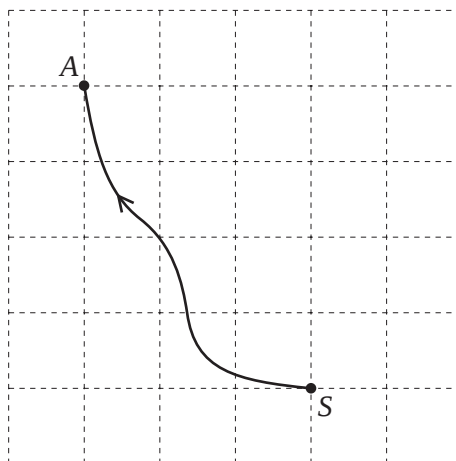
DO **NOT** WRITE IN ANY BARCODES.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 56.

This document consists of **11** printed pages and **1** blank page.

1



The diagram shows the map of part of an orienteering course.
Sanji runs from the start, S , to the point A .

Write $\vec{SA}$ as a column vector.

Answer $\begin{pmatrix} \\ \end{pmatrix}$ [1]

- 2 When Ali takes a penalty, the probability that he will score a goal is $\frac{4}{5}$.

Ali takes 30 penalties.

Find how many times he is expected to score a goal.

Answer [2]

- 3 The ratio of Anne's height : Ben's height is 7 : 9.
Anne's height is 1.4 m.

Find Ben's height.

Answer m [2]

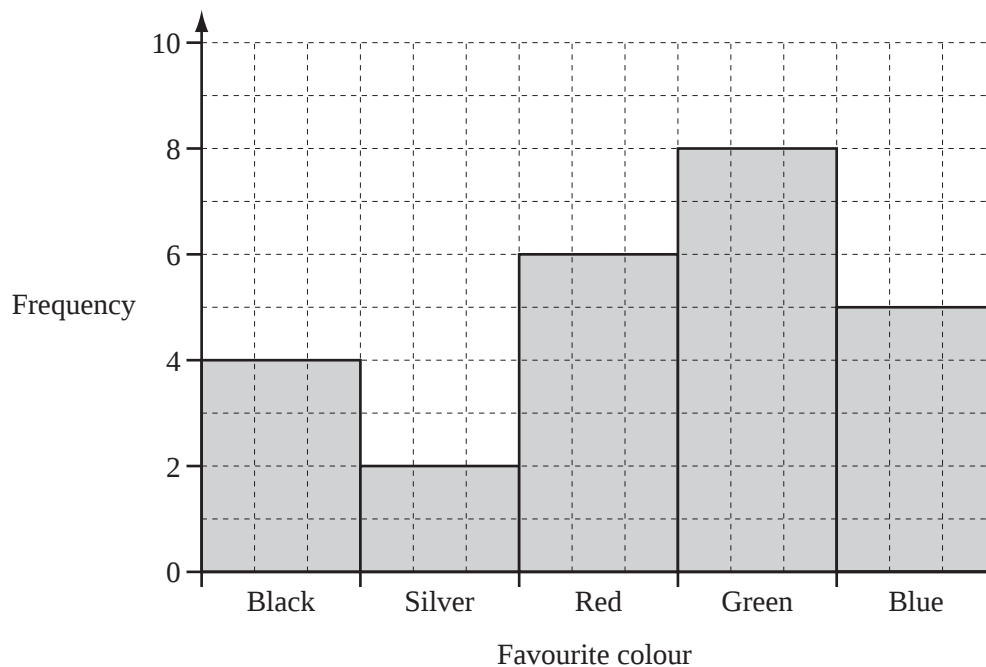
- 4 The distance between the centres of two villages is 8 km.
A map on which they are shown has a scale of 1 : 50 000.

Calculate the distance between the centres of the two villages on the map.
Give your answer in centimetres.

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Answer cm [2]

5



The bar chart shows the favourite colours of students in a class.

- (a) How many students are in the class?

Answer(a) [1]

- (b) Write down the modal colour.

Answer(b) [1]

- 6 Use your calculator to find $\sqrt{\frac{45 \times 5.75}{3.1 + 1.5}}$.

Answer [2]

- 7 (a) Calculate 60% of 200.

Answer(a) [1]

- (b) Write 0.36 as a fraction.
Give your answer in its lowest terms.

Answer(b) [2]

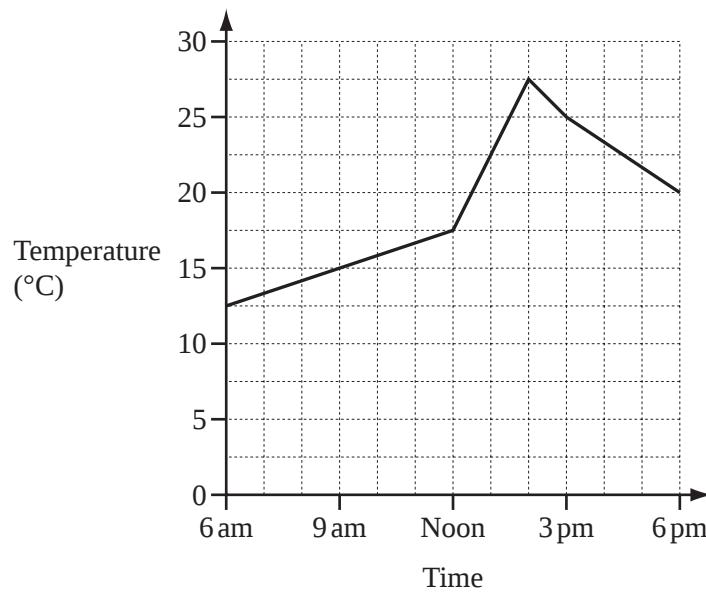
- 8 A circle has a radius of 50 cm.

- (a) Calculate the area of the circle in cm^2 .

Answer(a) cm^2 [2]

- (b) Write your answer to **part (a)** in m^2 .

Answer(b) m^2 [1]



The graph shows the temperature in Paris from 6 am to 6 pm one day.

- (a) What was the temperature at 9 am?

Answer(a) °C [1]

- (b) Between which two times was the temperature decreasing?

Answer(b) and [1]

- (c) Work out the difference between the maximum and minimum temperatures shown.

Answer(c) °C [1]

- 10 (a) Write down the mathematical name of a quadrilateral that has exactly two lines of symmetry.

Answer(a) [1]

- (b) Write down the mathematical name of a triangle with exactly one line of symmetry.

Answer(b) [1]

- (c) Write down the order of rotational symmetry of a regular pentagon.

Answer(c) [1]

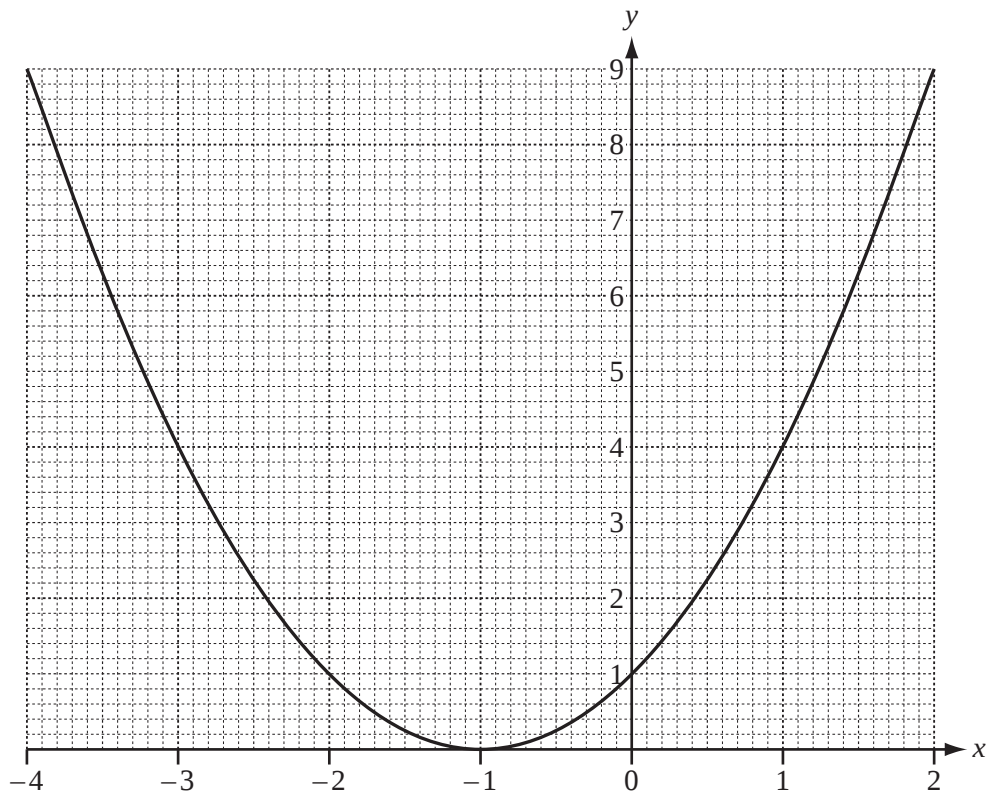
- 11 Without using your calculator, work out $\frac{1}{2}\left(\frac{2}{3} + \frac{1}{4}\right)$.

Show all your working clearly and give your answer as a fraction.

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Answer [3]

12

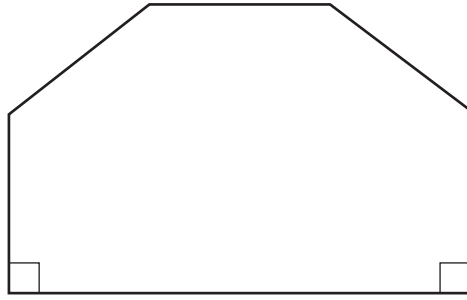


The diagram shows the graph of $y = (x + 1)^2$ for $-4 \leq x \leq 2$.

- (a) On the same grid, draw the line $y = 3$. [1]
- (b) Use your graph to find the solutions of $(x + 1)^2 = 3$.
Give each solution correct to 1 decimal place.

Answer(b) $x =$ or $x =$ [2]

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The front of a house is in the shape of a hexagon with two right angles.
The other four angles are all the same size.

Calculate the size of one of these angles.

Answer [3]

14 (a) Expand and simplify.

$$2(3x - 2) + 3(x - 2)$$

Answer(a) [2]

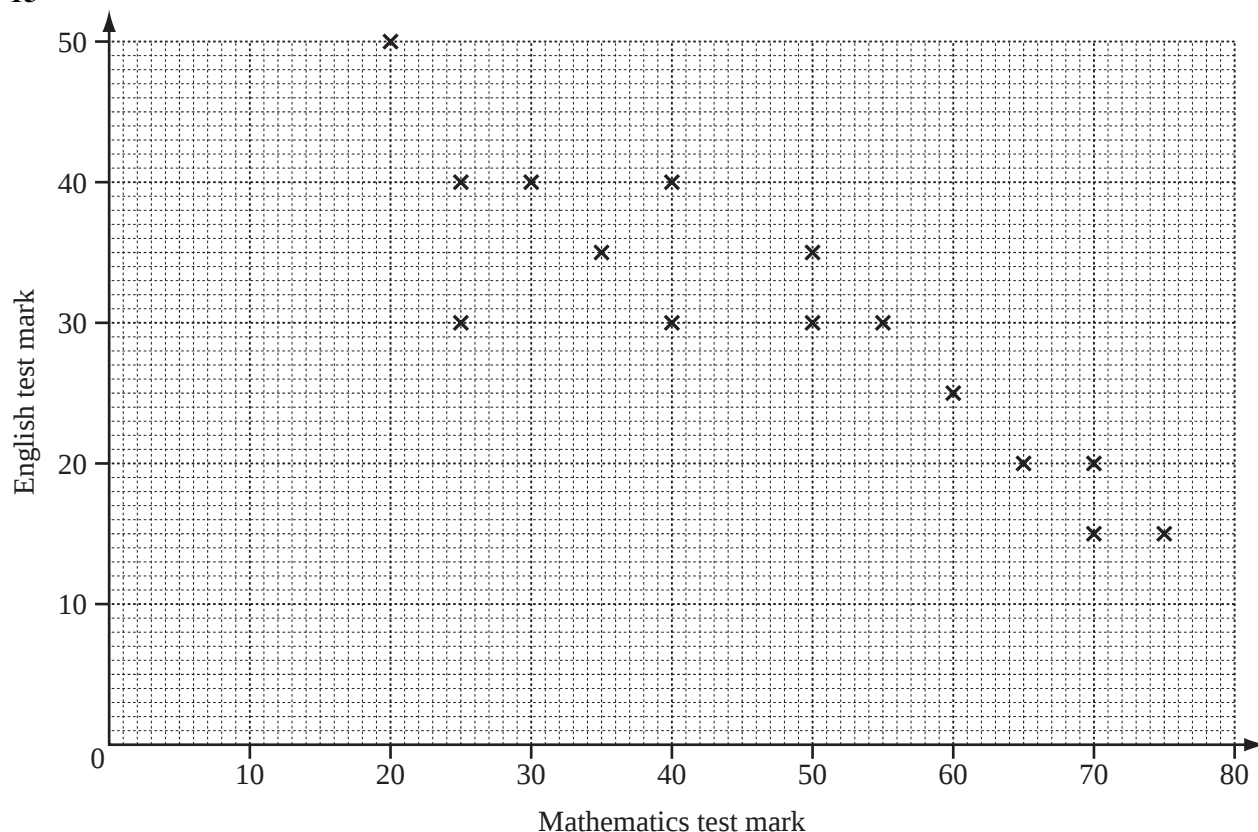
(b) Expand.

$$x(2x^2 - 3)$$

Answer(b) [2]

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15



The scatter diagram shows the marks obtained in a Mathematics test and the marks obtained in an English test by 15 students.

- (a) Describe the correlation.

Answer(a) [1]

- (b) The mean for the Mathematics test is 47.3 .
The mean for the English test is 30.3 .

Plot the mean point (47.3, 30.3) on the scatter diagram above. [1]

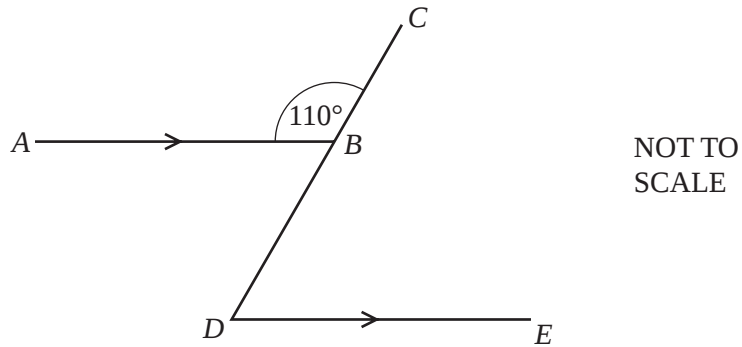
- (c) (i) Draw the line of best fit on the diagram above. [1]

- (ii) One student missed the English test.
She received 45 marks in the Mathematics test.

Use your line to estimate the mark she might have gained in the English test.

Answer(c)(ii) [1]

16 (a)

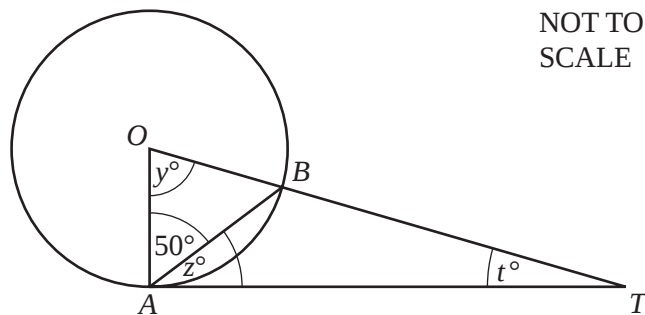


In the diagram, AB is parallel to DE .
Angle $ABC = 110^\circ$.

Find angle BDE .

Answer(a) Angle $BDE = \dots\dots\dots$ [2]

(b)



TA is a tangent at A to the circle, centre O .
Angle $OAB = 50^\circ$.

Find the value of

(i) y ,

Answer(b)(i) $y = \dots\dots\dots$ [1]

(ii) z ,

Answer(b)(ii) $z = \dots\dots\dots$ [1]

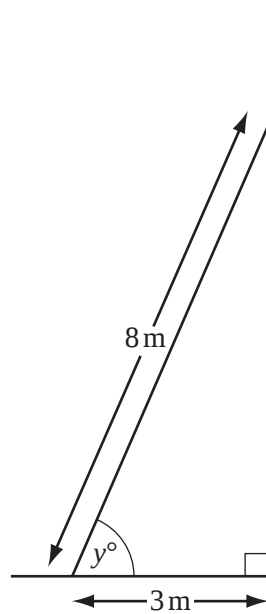
(iii) t .

Answer(b)(iii) $t = \dots\dots\dots$ [1]

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The diagram shows a ladder, of length 8 m, leaning against a vertical wall. The bottom of the ladder stands on horizontal ground, 3 m from the wall.

- (a) Find the height of the top of the ladder above the ground.

Answer(a) m [3]

- (b) Use trigonometry to calculate the value of y .

Answer(b) $y =$ [2]

- 18 (a) Lucinda invests \$500 at a rate of 5% per year **simple** interest.

Calculate the interest Lucinda has after 3 years.

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Answer(a) \$ [2]

- (b) Andy invests \$500 at a rate of 5% per year **compound** interest.

Calculate how much more interest Andy has than Lucinda after 3 years.

Answer(b) \$ [4]

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