

1 Calculate

$$\frac{5^2}{2^5}$$

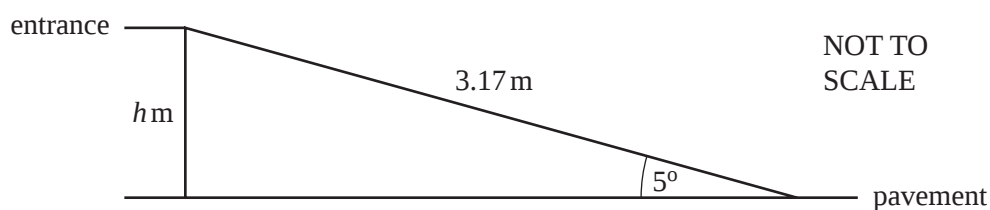
(a) giving your answer as a fraction,

Answer (a) [1]

(b) giving your answer as a decimal.

Answer (b) [1]

2



A shop has a wheelchair ramp to its entrance from the pavement. The ramp is 3.17 metres long and is inclined at 5° to the horizontal. Calculate the height, h metres, of the entrance above the pavement. Show all your working.

Answer m [2]

3 A block of cheese, of mass 8 kilograms, is cut by a machine into 500 equal slices.

(a) Calculate the mass of one slice of cheese in kilograms.

Answer (a) kg [1]

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

Answer (b) kg [1]

- 4 Calculate the value of $(\cos 40^\circ)^2 + (\sin 40^\circ)^2$.

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Answer [2]

5

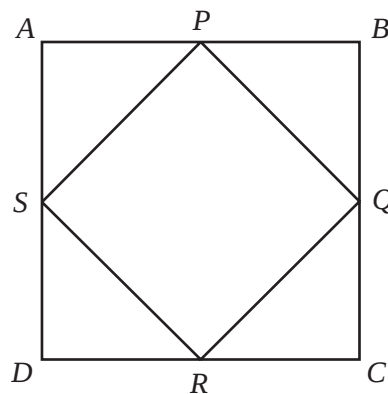


- (a) Write down the order of rotational symmetry of the diagram.

Answer (a) [1]

- (b) Draw the lines of symmetry on the diagram. [1]

- 6 A square $ABCD$, of side 8 cm, has another square, $PQRS$, drawn inside it. P, Q, R and S are at the midpoints of each side of the square $ABCD$, as shown in the diagram.



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- (a) Calculate the length of PQ .

Answer (a) cm [2]

- (b) Calculate the area of the square $PQRS$.

Answer (b) cm^2 [1]

- 7 To raise money for charity, Jalaj walks 22 km, correct to the nearest kilometre, every day for 5 days.

(a) Complete the statement in the answer space for the distance, d km, he walks in one day.

Answer (a) $\leq d <$ [2]

(b) He raises \$1.60 for every kilometre that he walks.

Calculate the least amount of money that he raises at the end of the 5 days.

Answer (b) \$ [1]

- 8 Solve the simultaneous equations

$$\frac{1}{2}x + 2y = 16,$$

$$2x + \frac{1}{2}y = 19.$$

Answer $x =$

$y =$ [3]

- 9 The wavelength, w , of a radio signal is inversely proportional to its frequency, f .
When $f = 200$, $w = 1500$.

(a) Find an equation connecting f and w .

Answer (a) [2]

(b) Find the value of f when $w = 600$.

Answer (b) $f =$ [1]

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- 10 Rooms in a hotel are numbered from 1 to 19.
Rooms are allocated at random as guests arrive.

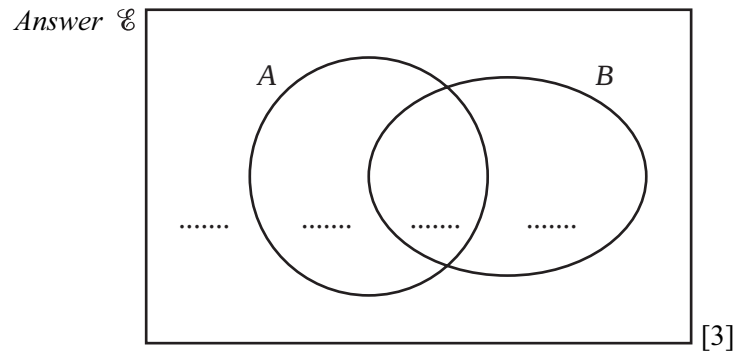
(a) What is the probability that the first guest to arrive is given a room which is a prime number?
(1 is not a prime number.)

Answer (a) [2]

(b) The first guest to arrive is given a room which is a prime number.
What is the probability that the second guest to arrive is given a room which is a prime number?

Answer (b) [1]

- 11 $n(\mathcal{C}) = 21$, $n(A \cup B) = 19$, $n(A \cap B') = 8$ and $n(A) = 12$.
Complete the Venn diagram to show this information.



12

$$\mathbf{M} = \begin{pmatrix} x & 2x \\ 2x & x \end{pmatrix}.$$

Find

(a) $2\mathbf{M}$,

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

(b) $\mathbf{M}^2$.

Answer (b) $\begin{pmatrix} & \\ & \end{pmatrix}$ [2]

13



Pattern 1



Pattern 2



Pattern 3

The first three patterns in a sequence are shown above.

(a) Complete the table.

Pattern number	1	2	3	4
Number of dots	5			

[1]

(b) Find a formula for the number of dots, d , in the n th pattern.

Answer (b) $d = \dots\dots\dots$ [1]

(c) Find the number of dots in the 60th pattern.

Answer (c) $\dots\dots\dots$ [1]

(d) Find the number of the pattern that has 89 dots.

Answer (d) $\dots\dots\dots$ [1]

14 A house was built in 1985 and cost \$62 000.
It was sold in 2003 for \$310 000.

(a) Work out the 1985 price as a percentage of the 2003 price.

Answer (a) $\dots\dots\dots$ % [2]

(b) Calculate the percentage increase in the price from 1985 to 2003.

Answer (b) $\dots\dots\dots$ % [2]

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15 The points $A(6,2)$ and $B(8,5)$ lie on a straight line.

(a) Work out the gradient of this line.

Answer (a) [1]

(b) Work out the equation of the line, giving your answer in the form $y = mx + c$.

Answer (b) [2]

16 Simplify

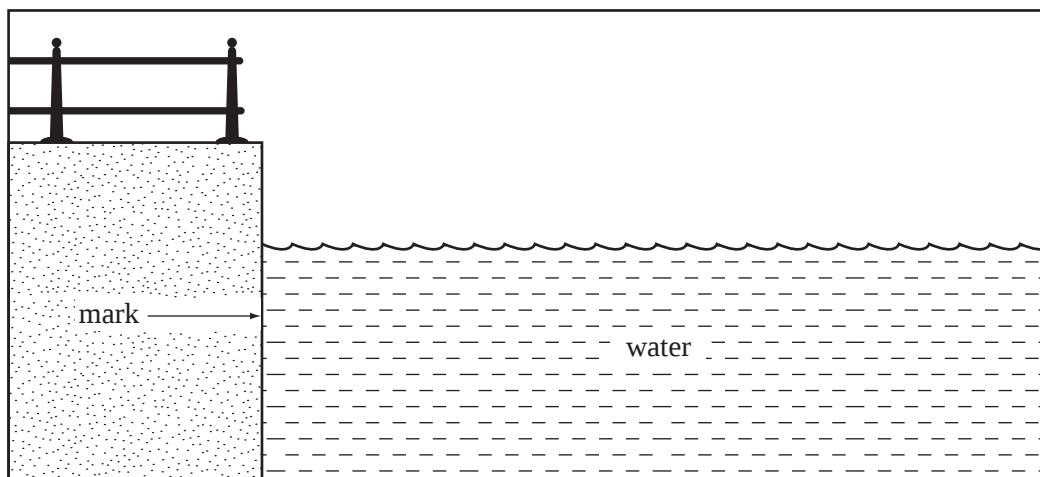
$$\frac{x+2}{x} - \frac{x}{x+2}.$$

Write your answer as a fraction in its simplest form.

Answer [3]

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Use

17



For
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The height, h metres, of the water, above a mark on a harbour wall, changes with the tide. It is given by the equation

$$h = 3\sin(30t)^\circ$$

where t is the time in hours after midday.

(a) Calculate the value of h at midday.

Answer (a) [1]

(b) Calculate the value of h at 19 00.

Answer (b) [2]

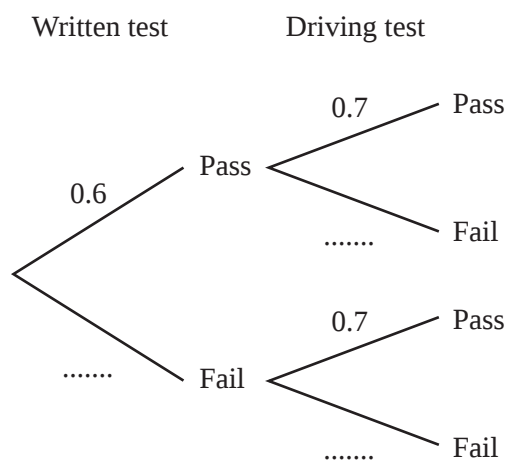
(c) Explain the meaning of the negative sign in your answer.

Answer (c) [1]

- 18** Revina has to pass a written test and a driving test before she can drive a car on her own.
The probability that she passes the written test is 0.6.
The probability that she passes the driving test is 0.7.

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- (a)** Complete the tree diagram below.



[1]

- (b)** Calculate the probability that Revina passes only one of the two tests.

Answer (b) [3]

- 19** Solve

(a) $0.2x + 3.6 = 1.2$,

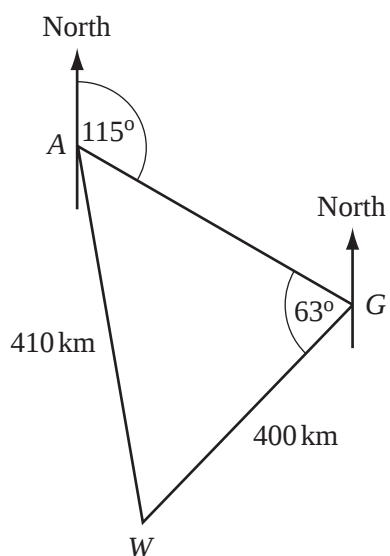
Answer (a) $x =$ [2]

(b) $\frac{2-3x}{5} < x + 2$.

Answer (b) [3]

- 20 A plane flies from Auckland (A) to Gisborne (G) on a bearing of 115° . The plane then flies on to Wellington (W). Angle $AGW = 63^\circ$.

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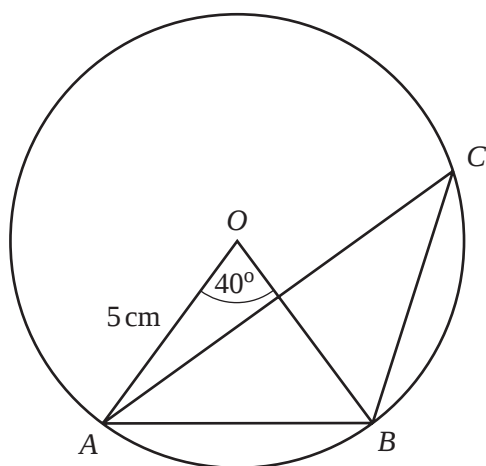
- (a) Calculate the bearing of Wellington from Gisborne.

Answer (a) [2]

- (b) The distance from Wellington to Gisborne is 400 kilometres.
The distance from Auckland to Wellington is 410 kilometres.

Calculate the bearing of Wellington from Auckland.

Answer (b) [4]

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A , B and C are points on a circle, centre O .
Angle $AOB = 40^\circ$.

- (a) (i) Write down the size of angle ACB .

Answer (a)(i) Angle $ACB =$ [1]

- (ii) Find the size of angle OAB .

Answer (a)(ii) Angle $OAB =$ [1]

- (b) The radius of the circle is 5 cm.

- (i) Calculate the length of the minor arc AB .

Answer (b)(i) cm [2]

- (ii) Calculate the area of the minor sector OAB .

Answer (b)(ii) cm^2 [2]

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