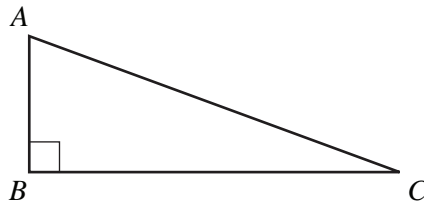


- 1 In the right-angled triangle ABC , $\cos C = \frac{4}{5}$. Find angle A .



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Answer Angle $A = \dots\dots\dots$ [2]

- 2 Which of the following numbers are irrational?

$$\frac{2}{3} \quad \sqrt{36} \quad \sqrt{3} + \sqrt{6} \quad \pi \quad 0.75 \quad 48\% \quad 8^{\frac{1}{3}}$$

Answer $\dots\dots\dots$ [2]

- 3 Show that $1\frac{5}{9} \div 1\frac{7}{9} = \frac{7}{8}$.

Write down all the steps in your working.

Answer

[2]

4 $\frac{3}{5} < p < \frac{2}{3}$

Which of the following could be a value of p ?

$\frac{16}{27}$ 0.67 60% $(0.8)^2$ $\sqrt{\frac{4}{9}}$

Answer [2]

5 A meal on a boat costs 6 euros (€) or 11.5 Brunei dollars (\$).

In which currency does the meal cost less, on a day when the exchange rate is €1 = \$1.9037?
Write down all the steps in your working.

Answer [2]

6 Use your calculator to find the value of $2^{\sqrt{3}}$.

Give your answer correct to 4 significant figures.

Answer [2]

7 Solve the equation $4x + 6 \times 10^3 = 8 \times 10^4$.

Give your answer in standard form.

Answer $x =$ [3]

8 p varies directly as the square root of q .
 $p = 8$ when $q = 25$.

Find p when $q = 100$.

Answer $p =$ [3]

9 Ashraf takes 1500 steps to walk d metres from his home to the station.
Each step is 90 centimetres correct to the nearest 10 cm.

Find the lower bound and the upper bound for d .

Answer $\leq d <$ [3]

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- 10 The table shows the opening and closing times of a café.

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Opening time	0600	0600	0600	0600	0600	(a)	0800
Closing time	2200	2200	2200	2200	2200	2200	1300

- (a) The café is open for a total of 100 hours each week.
Work out the opening time on Saturday.

Answer(a) [2]

- (b) The owner decides to close the café at a later time on Sunday. This increases the **total** number of hours the café is open by 4%.
Work out the new closing time on Sunday.

Answer(b) [1]

- 11 Rearrange the formula $c = \frac{4}{a-b}$ to make a the subject.

Answer $a =$ [3]

12 Solve the simultaneous equations.

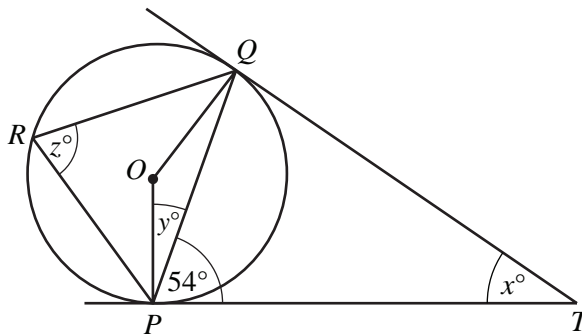
$$\begin{aligned}x - 5y &= 0 \\15x + 10y &= 17\end{aligned}$$

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Answer $x =$

$y =$ [3]

13



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The points P , Q and R lie on a circle, centre O .
 TP and TQ are tangents to the circle.
Angle $TPQ = 54^\circ$.

Calculate the value of

(a) x ,

Answer(a) $x =$ [1]

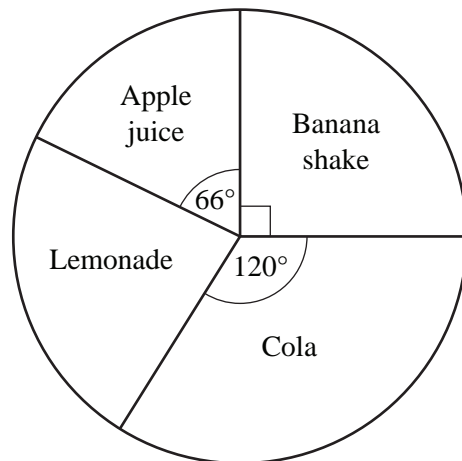
(b) y ,

Answer(b) $y =$ [1]

(c) z .

Answer(c) $z =$ [2]

- 14 60 students recorded their favourite drink.
The results are shown in the pie chart.



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- (a) Calculate the angle for the sector labelled Lemonade.

Answer(a) [1]

- (b) Calculate the number of students who chose Banana shake.

Answer(b) [1]

- (c) The pie chart has a radius of 3 cm.
Calculate the arc length of the sector representing Cola.

Answer(c) cm [2]

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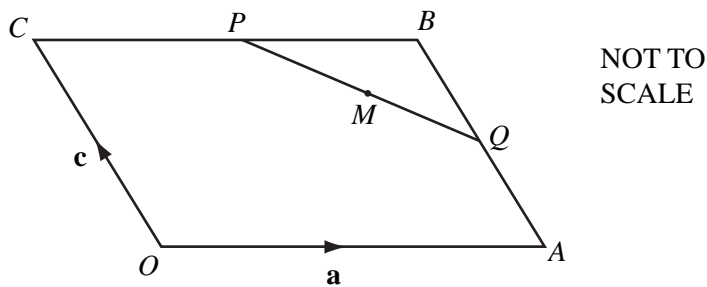
15 Write the following as a single fraction in its simplest form.

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

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Answer [4]

16



O is the origin and $OABC$ is a parallelogram.
 $CP = PB$ and $AQ = QB$.

$\vec{OA} = \mathbf{a}$ and $\vec{OC} = \mathbf{c}$.

Find in terms of \mathbf{a} and \mathbf{c} , in their simplest form,

(a) \vec{PQ} ,

Answer(a) $\vec{PQ} = \dots\dots\dots$ [2]

(b) the position vector of M , where M is the midpoint of PQ .

Answer(b) [2]

17 Simplify

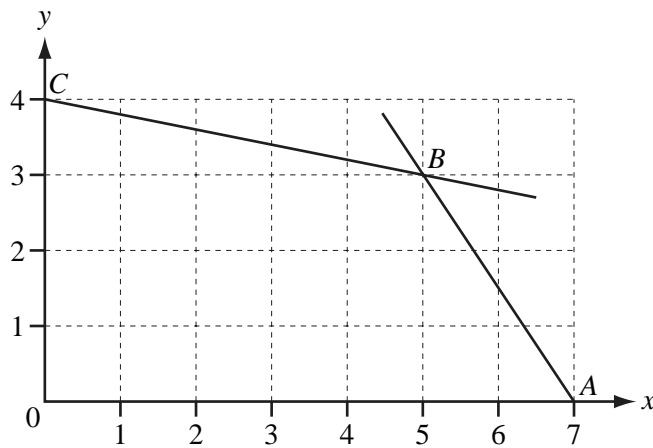
(a) $32x^8 \div 8x^{32}$,

Answer(a) [2]

(b) $\left(\frac{x^3}{64}\right)^{\frac{2}{3}}$.

Answer(b) [2]

18

The lines AB and CB intersect at B .(a) Find the co-ordinates of the midpoint of AB .

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

(b) Find the equation of the line CB .

Answer(b) [3]

19 $f(x) = x^2$ $g(x) = 2^x$ $h(x) = 2x - 3$

(a) Find $g(3)$.

Answer(a) [1]

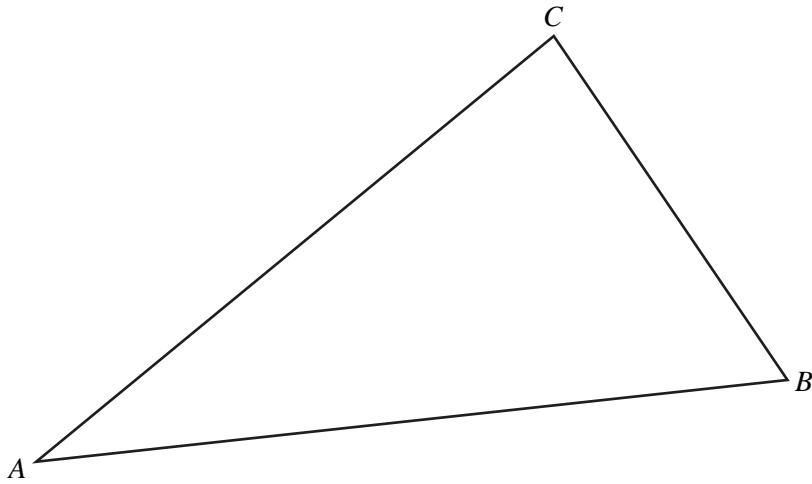
(b) Find $hh(x)$ in its simplest form.

Answer(b) [2]

(c) Find $fg(x + 1)$ in its simplest form.

Answer(c) [2]

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- (a) On the diagram above, **using a straight edge and compasses only**, construct
- (i) the bisector of angle ABC , [2]
 - (ii) the locus of points which are equidistant from A and from B . [2]
- (b) Shade the region inside the triangle which is nearer to A than to B **and** nearer to AB than to BC . [1]
-

Question 21 is printed on the next page.

21 (a)

$$\mathbf{A} = \begin{pmatrix} 2 & 3 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} 6 \\ -4 \end{pmatrix}$$

For
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Use(i) Work out \mathbf{AB} .*Answer(a)(i)* [2](ii) Work out \mathbf{BA} .*Answer(a)(ii)* [2]

$$(b) \mathbf{C} = \begin{pmatrix} 3 & 1 \\ 1 & 1 \end{pmatrix}$$

Find \mathbf{C}^{-1} , the inverse of \mathbf{C} .*Answer(b)* [2]

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