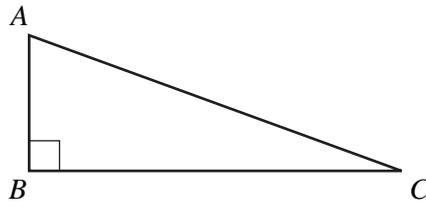




- 1 In the right-angled triangle  $ABC$ ,  $\cos C = \frac{4}{5}$ . Find angle  $A$ .



NOT TO  
SCALE

Answer Angle  $A =$  ..... [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 ..... [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]

---

3

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]

---

- 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]

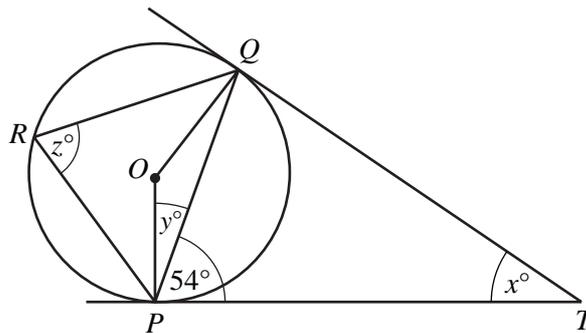
12 Solve the simultaneous equations.

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

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]

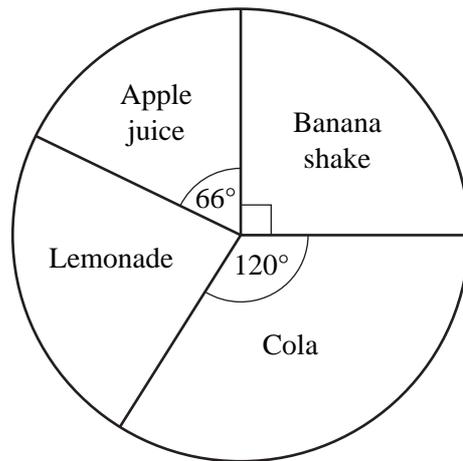
(b)  $y$ ,

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.



NOT TO  
SCALE

- (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.

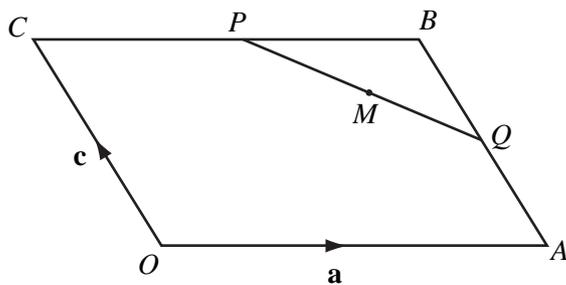
Answer(c) ..... cm [2]

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

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

Answer ..... [4]

16



NOT TO  
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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

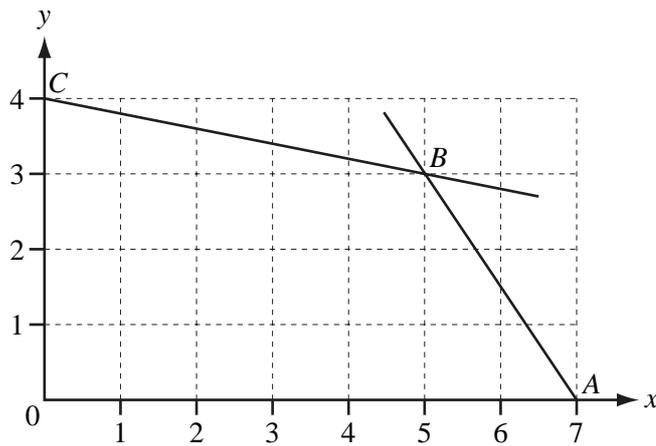
(a)  $32x^8 \div 8x^{32}$ ,

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]

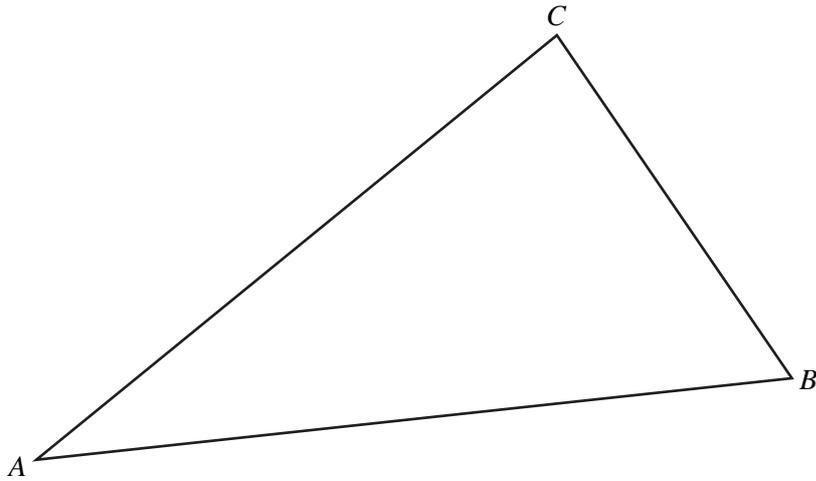
(b) Find  $hh(x)$  in its simplest form.

*Answer(b)* ..... [2]

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

*Answer(c)* ..... [2]

---



- (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]
-

21 (a)

$$\mathbf{A} = \begin{pmatrix} 2 & 3 \end{pmatrix}$$

$$\mathbf{B} = \begin{pmatrix} 6 \\ -4 \end{pmatrix}$$

(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]