

Starter

1) Solve $x^2 = 3x + 18$ for x .

$$x^2 - 3x - 18 = 0$$

$$(x + 3)(x - 6) = 0$$

$$x = -3 \text{ or } 6$$

18
1, 18
2, 9
3, 6

2) Simplify $\frac{x^4 \times x^{-1}}{x^3}$

$$= \frac{x^3}{x^3} = 1$$

3) Multiply out and simplify: $(a + 1)(2a - 5)(a - 2)$

$$= (2a^2 + 2a - 5a - 5)(a - 2)$$

$$= (2a^2 - 3a - 5)(a - 2)$$

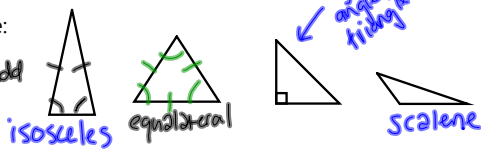
4) Calculate $\frac{5}{4t} \times \frac{2}{15} = \frac{10}{60t} = \frac{1}{6t}$

Today's Learning:

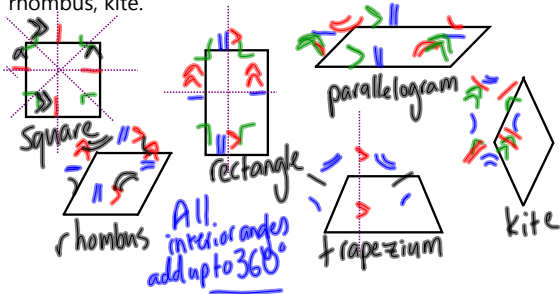
To revise the properties of 2D shapes.

2D Shape Properties

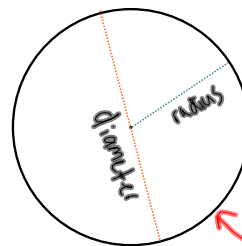
Triangle:
internal angles add to 180°



Quadrilaterals: square, rectangle, parallelogram, trapezium, rhombus, kite.



Circle



360° angle
Infinite lines of symmetry

perimeter = 'circumference'

Starter

Calculate:

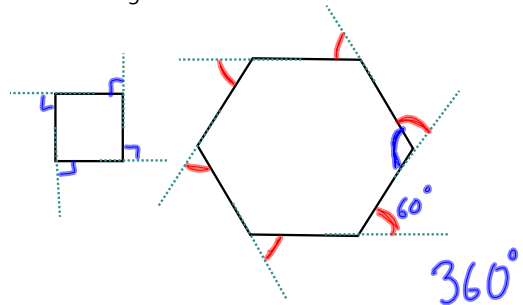
$$1) \frac{1}{3} - \frac{1}{6e} = \frac{2e}{6e} - \frac{1}{6e} = \frac{2e-1}{6e}$$

$$3) \frac{6}{7} \div \frac{12}{6y} = \frac{6}{7} \times \frac{6y}{12} = \frac{36y}{84} = \frac{3y}{7}$$

$$2) \frac{2}{4t} \times \frac{3}{2} = \frac{6}{8t} = \frac{3}{4t}$$

$$4) \frac{4}{15} + \frac{3r}{4} = \frac{16}{60} + \frac{45r}{60} = \frac{16+45r}{60}$$

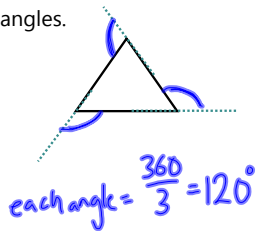
Exterior Angles...



Exterior Angles

2/10/17

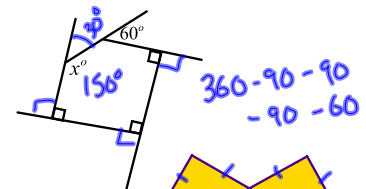
The exterior angles of any polygon add up to 360°. A regular polygon has equal exterior angles.



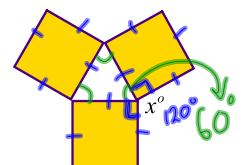
1) Find the size of each external angle in a regular...

- a) pentagon
- b) hexagon
- c) decagon

2) Find x .

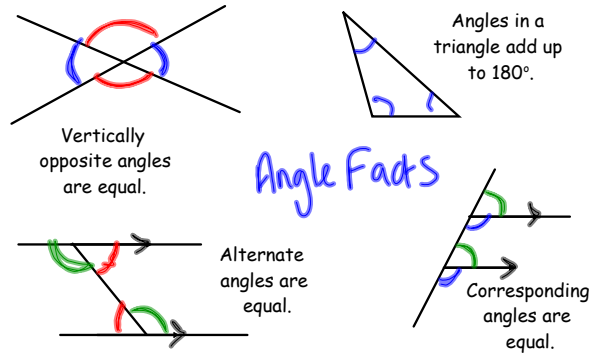


3) The diagram shows three squares of the same size. What is the value of x ?



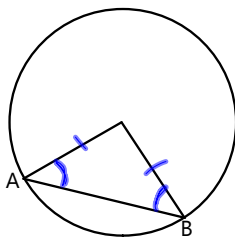
Today's Learning:

Revising angle facts and angles in circle facts.



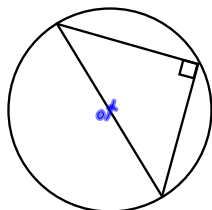
Revision: Angles in Circles

A **chord** is a line joining 2 points on the circumference, e.g. AB.



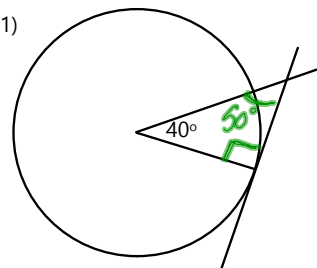
If radii are drawn from A and B, an isosceles triangle will be formed.

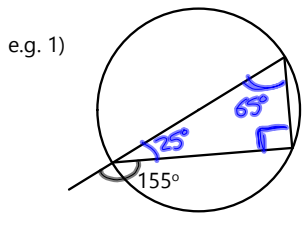
Any triangle in a semi-circle (using the diameter as base) is a **right angle triangle**.



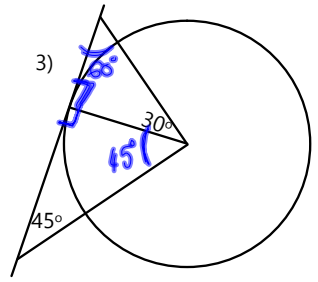
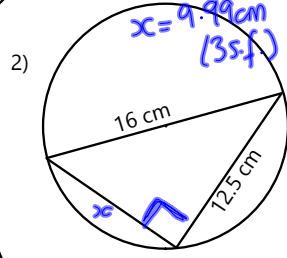
A tangent to a circle is a straight line that meets the circle at **exactly one** point. A tangent always meets a radius at a right angle.

e.g. 1)

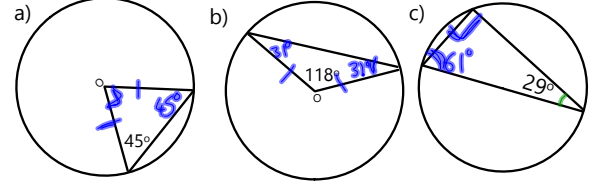




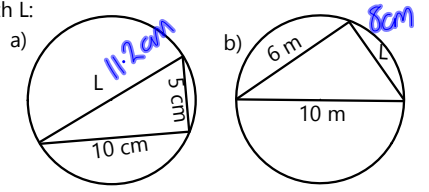
$a^2 = h^2 - b^2$
 $x^2 = 16^2 - 12.5^2$
 $= 99.75$



1) Fill in all the angles in these circles:

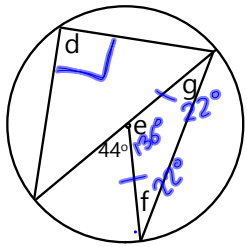
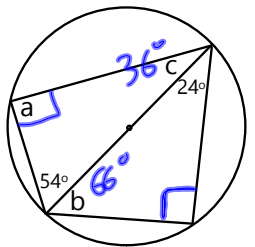


2) Find the length L:



Starter

Find missing angles a - g.



SOH CAH TOA practice

Find the missing length or angle:

$\sin(x) = \frac{\text{opp}}{\text{hyp}}$
 $\sin(70) = \frac{15}{A}$
 $A \times \sin(70) = 15$
 $A = \frac{15}{\sin(70)} = 16.0 \text{ cm (1 d.p.)}$

$\sin(x) = \frac{\text{opp}}{\text{hyp}}$
 $\sin(B) = \frac{14}{10}$
 $B = \sin^{-1}(\frac{14}{10}) = 45.6^\circ$ (1 d.p.)

$\cos(x) = \frac{\text{adj}}{\text{hyp}}$
 $\cos(22) = \frac{C}{17}$
 $C \times \cos(22) = 17$
 $C = \frac{17}{\cos(22)} = 18.3 \text{ cm (1 d.p.)}$

$\cos(x) = \frac{\text{adj}}{\text{hyp}}$
 $\cos(F) = \frac{16}{24}$
 $F = \cos^{-1}(\frac{16}{24}) = 48.2^\circ$ (1 d.p.)

$\tan(x) = \frac{\text{opp}}{\text{adj}}$
 $\tan(E) = \frac{11}{14}$
 $E = \tan^{-1}(\frac{11}{14}) = 38^\circ$

$\sin(x) = \frac{\text{opp}}{\text{hyp}}$
 $\sin(68) = \frac{D}{20}$
 $D \times \sin(68) = 20$
 $D = \frac{20}{\sin(68)}$

Starter

1) At a diner, Table 8 paid £12 for a burger and two milkshakes. Table 5 paid £35.50 for 3 milkshakes and 5 burgers. Write equations and hence find the price of burgers and milkshakes at the diner.

$$\begin{aligned}
 & b + 2m = 12 \quad \textcircled{1} \\
 & 5b + 3m = 35.50 \quad \textcircled{2} \\
 & -5 \times \textcircled{1} \quad -5b - 10m = -60 \\
 & \quad \quad \quad \textcircled{2} \quad \underline{5b + 3m = 35.50} \\
 & \quad \quad \quad -7m = -24.50 \\
 & \quad \quad \quad m = 3.5 \\
 & \text{use } \textcircled{1} \quad b + 2m = 12 \\
 & \quad \quad \quad b + 7 = 12 \\
 & \quad \quad \quad b = 5 \quad \text{burger } \pounds 5 \\
 & \quad \quad \quad \text{milkshake } \pounds 3.50
 \end{aligned}$$

2) Freya bought 2 Freddos and 3 Star Bars from the corner shop and paid £1.49. Fred bought 3 Freddos and 5 Star Bars from the same shop and paid £2.40. How much does the shop charge for each?

Today's Learning:

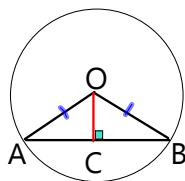
To use perpendicular bisectors to find missing lengths and angles in circles.

Perpendicular Bisectors in Circles

AB is a chord

Triangle AOB is isosceles

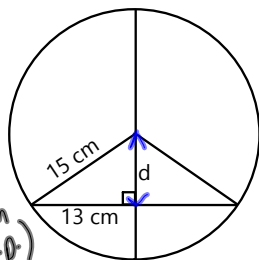
A **perpendicular bisector** is a line which cuts another line in half and does so at right angles.



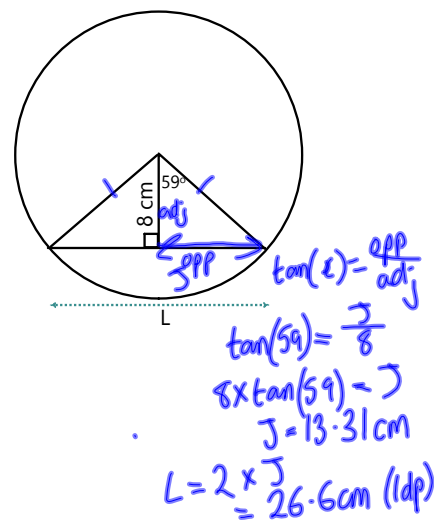
OC is a perpendicular bisector.

e.g. 1) Find d

$$\begin{aligned}
 a^2 &= h^2 + b^2 \\
 d^2 &= 15^2 - 13^2 \\
 &= 56 \\
 d &= \sqrt{56} = 7.48 \text{ cm (2 d.p.)}
 \end{aligned}$$

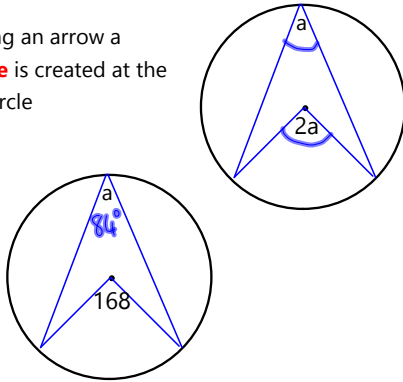


e.g. 2) Find L.

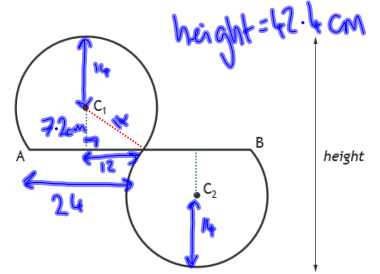


When creating an arrow a **double angle** is created at the centre of a circle

e.g. 3) Find a

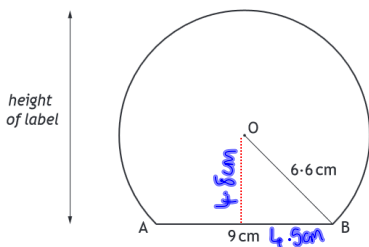


Two identical shapes are used to form a logo. Each shape is part of a circle. The circles have centres C_1 and C_2 . The radius of each is 14 cm.

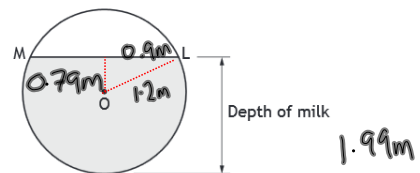


The logo has half-turn symmetry about the mid-point of AB. AB is 48 cm long. Calculate the height of the logo.

This perfume bottle has a label in the shape of part of a circle. A diagram of the label is shown below. The centre of the circle is O. The chord AB is 9 cm. The radius OB is 6.6 cm. Find the height of the label.



The diagram below shows the circular cross-section of a milk tank.



The radius of the circle, centre O, is 1.2 metres.

The width of the surface of the milk in the tank, represented by ML in the diagram, is 1.8 metres.

Calculate the depth of the milk in the tank.