

GEOMETRY: CIRCLE THEOREMS (LENGTHS & ANGLES)**Best Guess Mastery Worksheet (Target Grade 7/8)****I Do**

18. A , B , C and D are points on a circle.

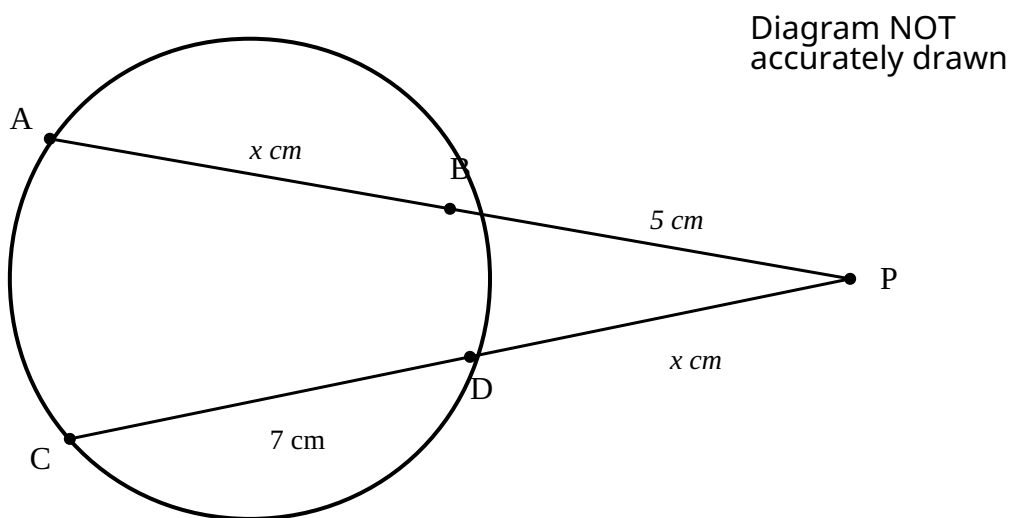
The chord AB and the chord CD are extended to intersect at the point P outside the circle.

$AB = x$ cm and $BP = 5$ cm.

$CD = 7$ cm and $DP = x$ cm.

Calculate the length of the chord AB .

Give your answer correct to 3 significant figures. Show your working clearly.



Answer = cm

GEOMETRY: CIRCLE THEOREMS (LENGTHS & ANGLES)**Best Guess Mastery Worksheet (Target Grade 7/8)****We Do**

A , B and C are points on a circle, centre O .

Angle $ACB = 42^\circ$.

Find the size of angle AOB . Give a reason for your answer.

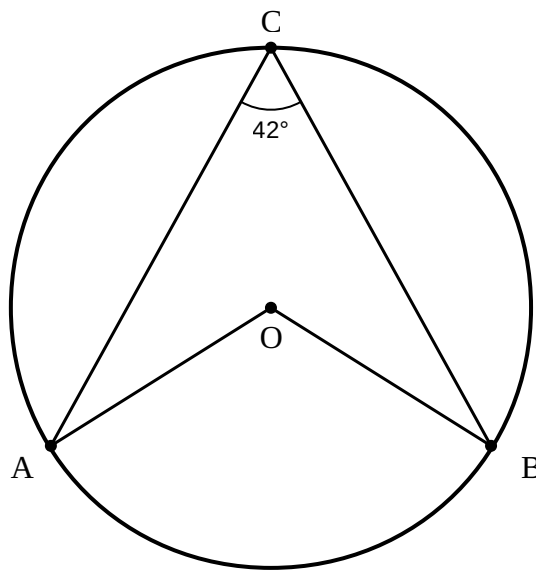


Diagram NOT
accurately drawn

Angle $AOB = \dots\dots\dots^\circ$

GEOMETRY: CIRCLE THEOREMS (LENGTHS & ANGLES)**Best Guess Mastery Worksheet (Target Grade 7/8)****You Do 1**

A , B and C are points on a circle.

The line SAT is a tangent to the circle at A .

Angle $BAT = 58^\circ$.

Find the size of angle ACB . Give a reason for your answer.

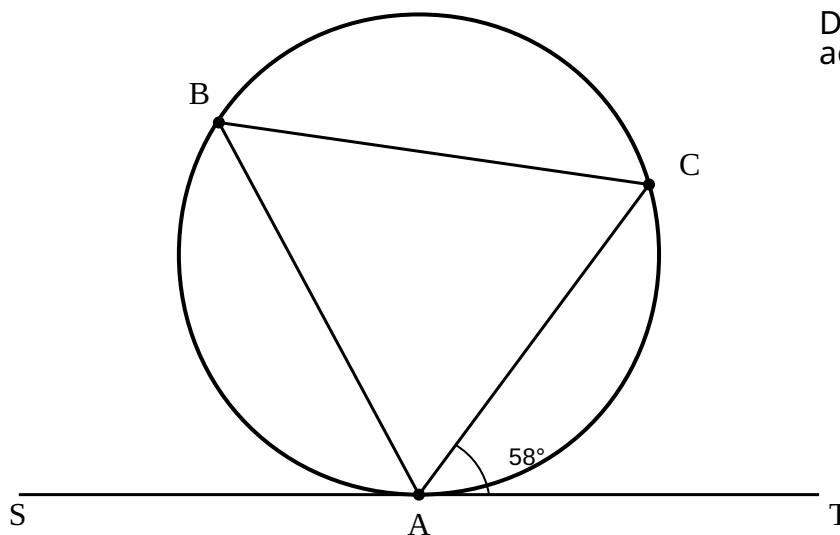


Diagram NOT
accurately drawn

Angle $ACB = \dots\dots\dots^\circ$

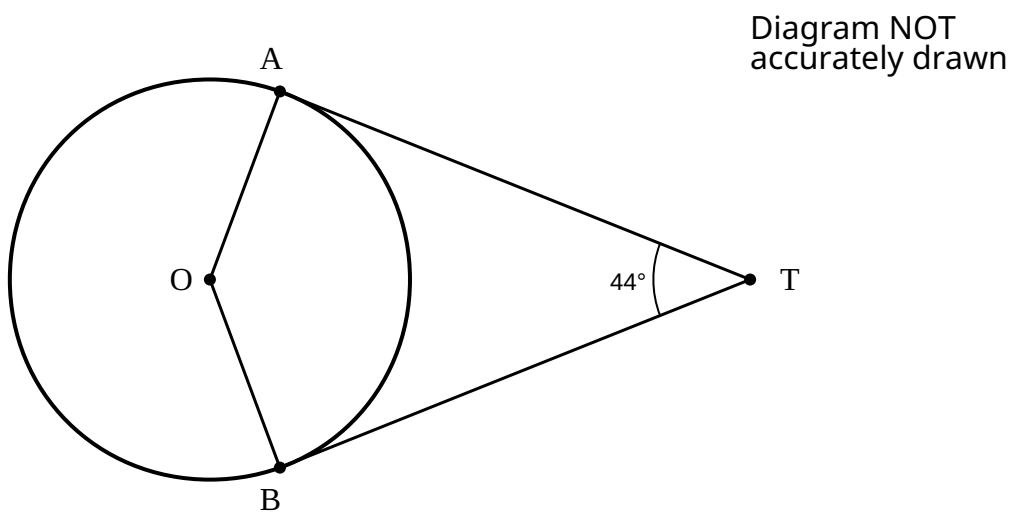
GEOMETRY: CIRCLE THEOREMS (LENGTHS & ANGLES)**Best Guess Mastery Worksheet (Target Grade 7/8)****You Do 2**

A and B are points on a circle, centre O .

TA and TB are tangents to the circle.

Angle $ATB = 44^\circ$.

Find the size of angle AOB . Give reasons for your answer.



Angle $AOB = \dots\dots\dots^\circ$

GEOMETRY: CIRCLE THEOREMS (ALGEBRAIC)**Best Guess Mastery Worksheet (Target Grade 7/8)****Challenge 1**

$PQRS$ is a cyclic quadrilateral.

Angle $SPQ = (3x + 25)^\circ$, Angle $PQR = (4y - 10)^\circ$.

Angle $QRS = (2x + 45)^\circ$, Angle $RSP = (y + 40)^\circ$.

Form and solve linear equations to find the values of x and y .

Show your algebraic working clearly.

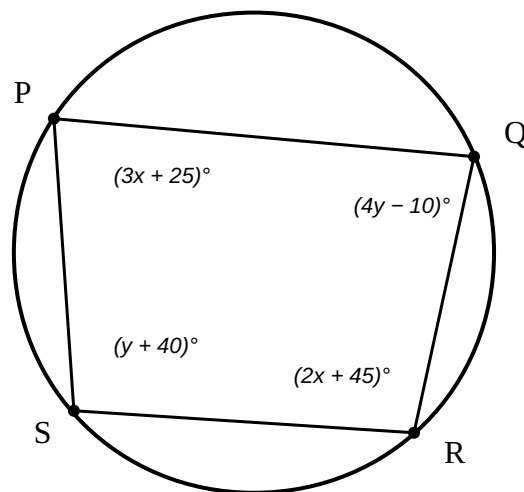


Diagram NOT
accurately drawn

$x =$ _____

$y =$ _____

GEOMETRY: CIRCLE THEOREMS (ALGEBRAIC)**Best Guess Mastery Worksheet (Target Grade 7/8)****Challenge 2**

A , B and C are points on the circumference of a circle, centre O .

Angle $AOB = (5x - 14)^\circ$.

Angle $ACB = (2x + 11)^\circ$.

Form and solve a linear equation to find the true size of angle ACB .

Show your algebraic working clearly.

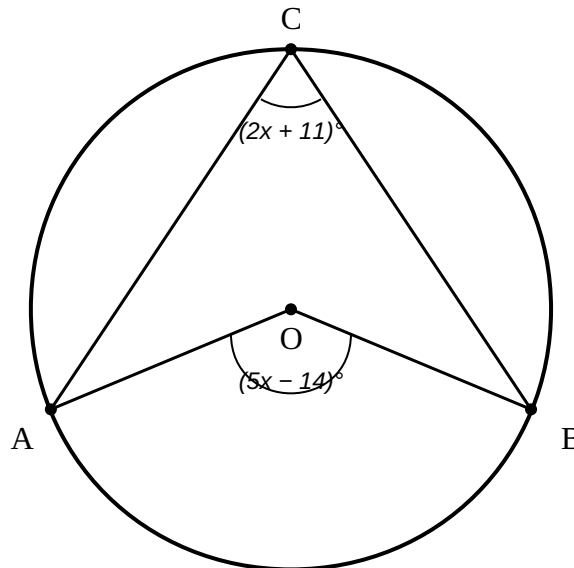


Diagram NOT
accurately drawn

Angle $ACB = \dots\dots\dots^\circ$

ANSWERS & WORKED SOLUTIONS

1/2

I Do

Using the intersecting secants theorem: $PA \times PB = PC \times PD$.

$$5(x + 5) = x(x + 7), \text{ so } 5x + 25 = x^2 + 7x.$$

Rearranging gives $x^2 + 2x - 25 = 0$.

$$x = \frac{-2 \pm \sqrt{104}}{2}. \text{ The positive solution is } x = 4.099\dots$$

Therefore chord AB = 4.10 cm (3 significant figures).

We Do

$$\text{Angle AOB} = 2 \times 42 \text{ degrees} = 84 \text{ degrees}.$$

Reason: the angle at the centre is twice the angle at the circumference when both angles stand on the same arc.

You Do 1

$$\text{Angle ACB} = 58 \text{ degrees}.$$

Reason: by the alternate segment theorem, the angle between a tangent and a chord equals the angle in the alternate segment.

ANSWERS & WORKED SOLUTIONS

2/2

You Do 2

Angles OAT and OBT are both 90 degrees because a tangent is perpendicular to the radius at the point of contact.

Angles in quadrilateral OATB total 360 degrees.

Angle AOB = $360 - 90 - 90 - 44 = 136$ degrees.

Challenge 1

Opposite angles in a cyclic quadrilateral sum to 180 degrees.

$(3x + 25) + (2x + 45) = 180$, so $5x + 70 = 180$ and $x = 22$.

$(4y - 10) + (y + 40) = 180$, so $5y + 30 = 180$ and $y = 30$.

Challenge 2

The angle at the centre is twice the angle at the circumference.

$5x - 14 = 2(2x + 11)$, so $5x - 14 = 4x + 22$ and $x = 36$.

Angle ACB = $2(36) + 11 = 83$ degrees.