

# GCSE Maths: Tangents and radii (Higher): worksheet

GCSE Maths - Circle Theorems - Higher - Lesson 26.6

Name: \_\_\_\_\_

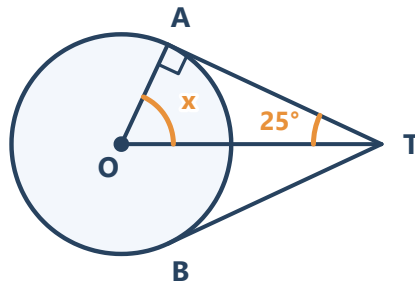
Date: \_\_\_\_\_

Score: \_\_\_\_\_

25 questions. Write your answers in the spaces. Answers and step-by-step help are free at [websink.site/gcse/maths/ch26-circle-theorems/higher/tangents-and-radii/](https://websink.site/gcse/maths/ch26-circle-theorems/higher/tangents-and-radii/)

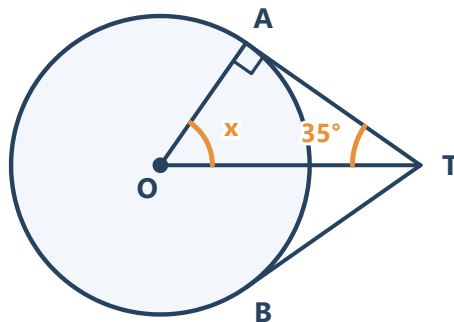
## Exercise 26F Tangents and radii Non-calculator

- 1  $TA$  is a tangent to the circle with centre  $O$ , touching the circle at  $A$ . Angle  $ATO = 25^\circ$ . Work out the size of angle  $AOT$ . Give a reason for each step.



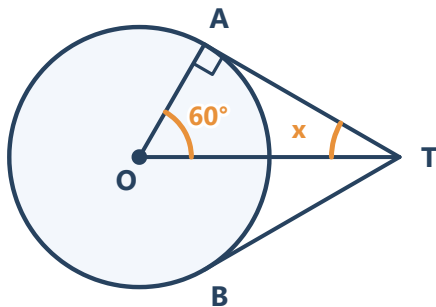
Answer: .....

- 2  $TA$  is a tangent to the circle with centre  $O$ , touching the circle at  $A$ . Angle  $ATO = 35^\circ$ . Work out the size of angle  $AOT$ . Give a reason for each step.



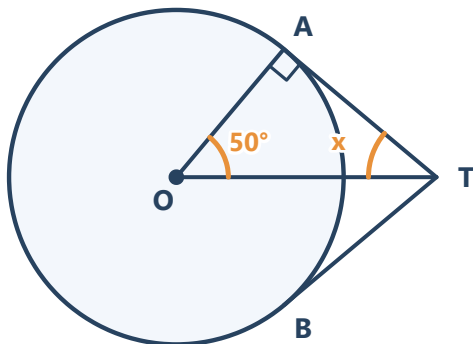
Answer: .....

- 3  $TA$  is a tangent to the circle with centre  $O$ , touching the circle at  $A$ . Angle  $AOT = 60^\circ$ . Work out the size of angle  $ATO$ . Give a reason for each step.



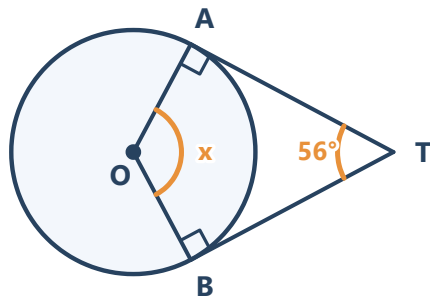
Answer:

- 4  $TA$  is a tangent to the circle with centre  $O$ , touching the circle at  $A$ . Angle  $AOT = 50^\circ$ . Work out the size of angle  $ATO$ . Give a reason for each step.



Answer:

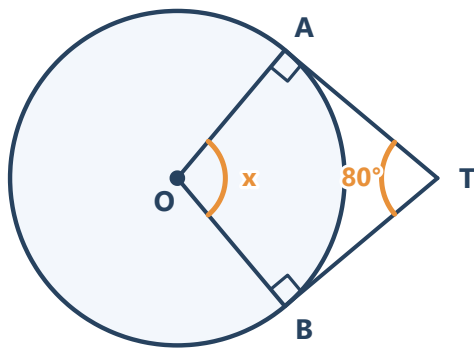
- 5  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Angle  $ATB = 56^\circ$ . Work out the size of angle  $AOB$ . Give a reason for each step.



Answer:

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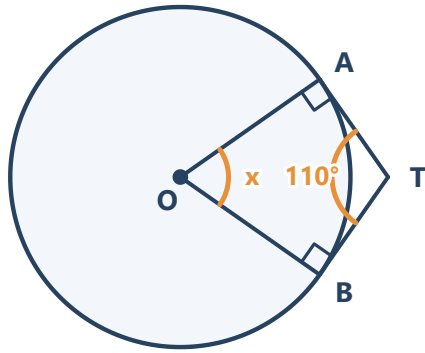
- 6**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Angle  $ATB = 80^\circ$ . Work out the size of angle  $AOB$ . Give a reason for each step.



Answer:

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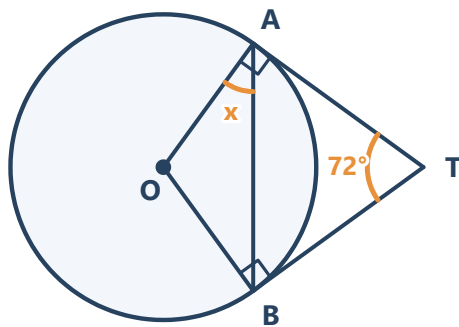
- 7**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Angle  $ATB = 110^\circ$ . Work out the size of angle  $AOB$ . Give a reason for each step.



Answer:

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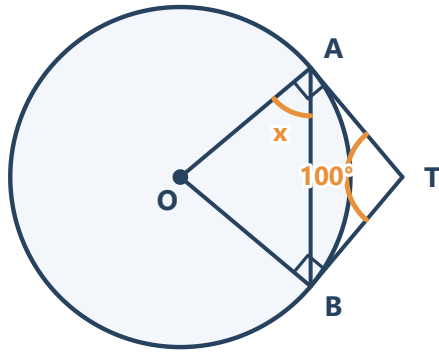
- 8**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Angle  $ATB = 72^\circ$ . Work out the size of angle  $OAB$ . Give a reason for each step.



Answer:

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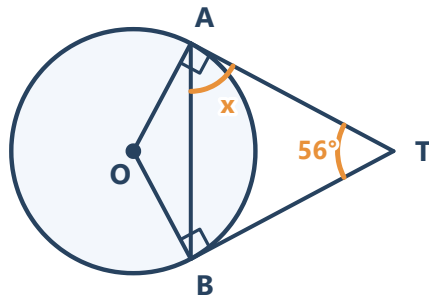
- 9**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Angle  $ATB = 100^\circ$ . Work out the size of angle  $OAB$ . Give a reason for each step.



Answer:

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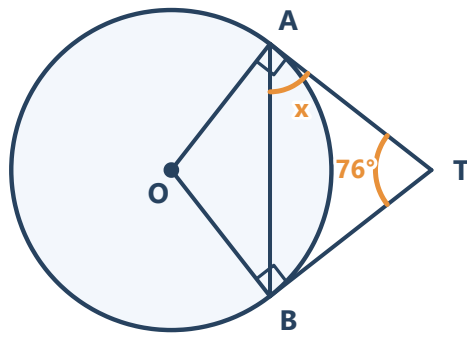
- 10**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Angle  $ATB = 56^\circ$ . Work out the size of angle  $TAB$ . Give a reason for each step.



Answer:

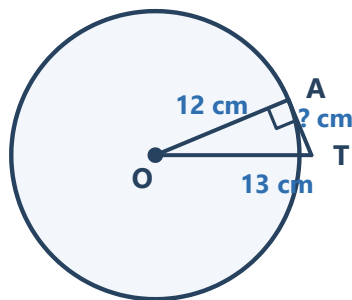
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- 11**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Angle  $ATB = 76^\circ$ . Work out the size of angle  $TAB$ . Give a reason for each step.



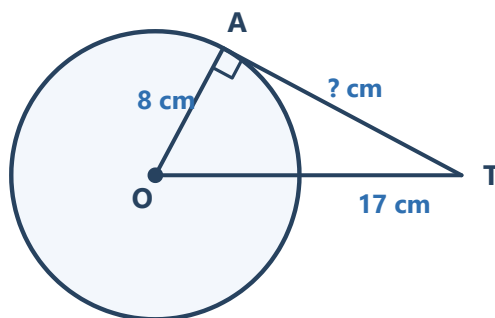
Answer:

- 12**  $TA$  is a tangent to a circle with centre  $O$ , touching it at  $A$ . The radius of the circle is 12 cm and  $OT = 13$  cm. Work out the length of  $TA$ .



Answer:

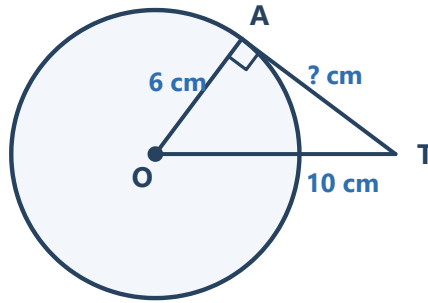
- 13**  $TA$  is a tangent to a circle with centre  $O$ , touching it at  $A$ . The radius of the circle is 8 cm and  $OT = 17$  cm. Work out the length of  $TA$ .



Answer:

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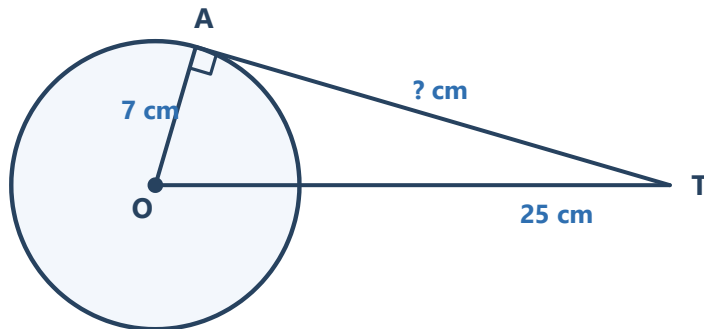
- 14**  $TA$  is a tangent to a circle with centre  $O$ , touching it at  $A$ . The radius of the circle is 6 cm and  $OT = 10$  cm. Work out the length of  $TA$ .



Answer:

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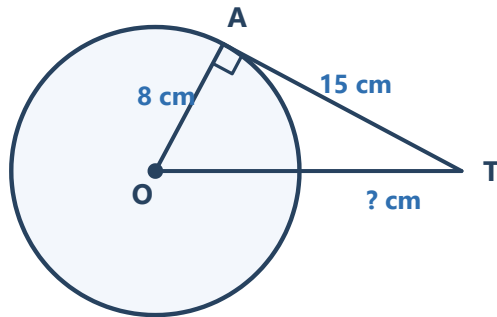
- 15**  $TA$  is a tangent to a circle with centre  $O$ , touching it at  $A$ . The radius of the circle is 7 cm and  $OT = 25$  cm. Work out the length of  $TA$ .



Answer:

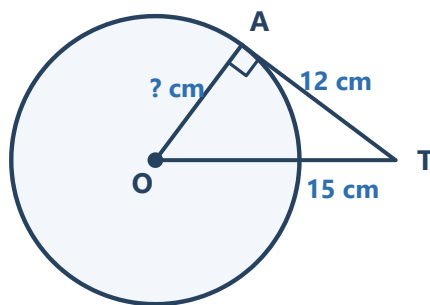
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- 16**  $TA$  is a tangent to a circle with centre  $O$ , touching it at  $A$ . The radius of the circle is 8 cm and  $TA = 15$  cm. Work out the distance  $OT$ .



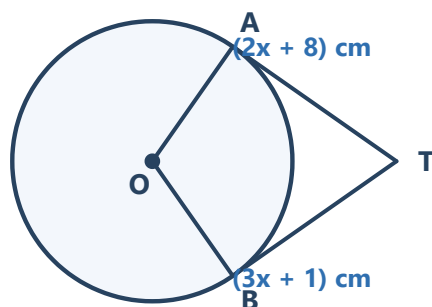
Answer: \_\_\_\_\_

- 17**  $TA$  is a tangent to a circle with centre  $O$ , touching it at  $A$ .  $TA = 12$  cm and  $OT = 15$  cm. Work out the radius of the circle.



Answer: \_\_\_\_\_

- 18**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ .  $TA = (2x + 8)$  cm and  $TB = (3x + 1)$  cm.



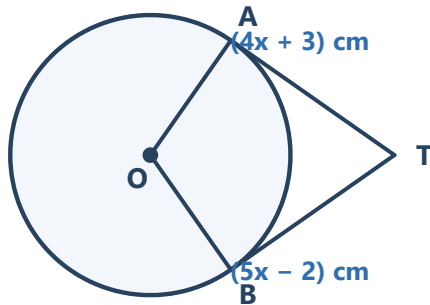
(a) Work out the value of  $x$ .

Answer: .....

(b) Work out the length of  $TA$ .

Answer: .....

**19**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ .  $TA = (4x + 3)$  cm and  $TB = (5x - 2)$  cm.



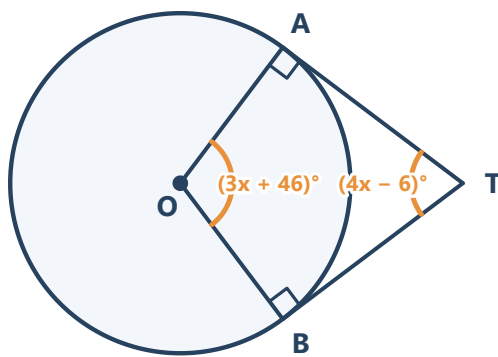
(a) Work out the value of  $x$ .

Answer: .....

(b) Work out the length of  $TA$ .

Answer: .....

**20**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Angle  $ATB = (4x - 6)^\circ$  and angle  $AOB = (3x + 46)^\circ$ .



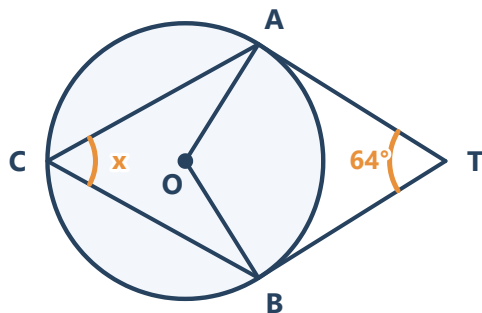
(a) Work out the value of  $x$ .

Answer: .....

(b) Work out the size of angle  $ATB$ .

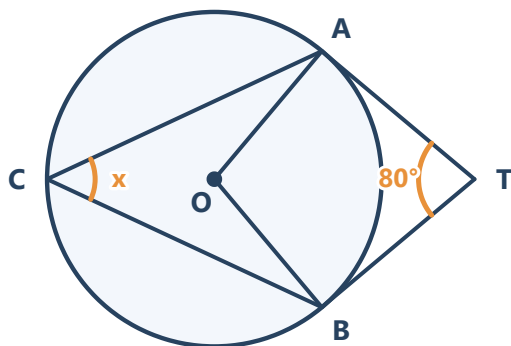
Answer: .....

- 21**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ .  $C$  is a point on the circle. Angle  $ATB = 64^\circ$ . Work out the size of angle  $ACB$ . Give a reason for each step.



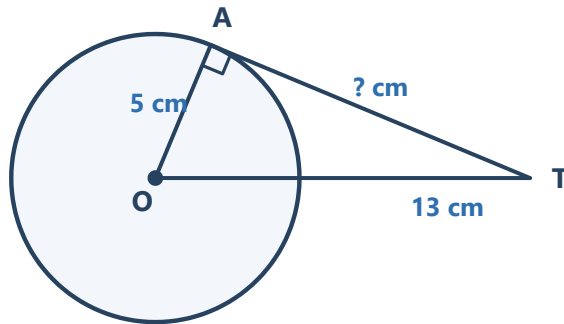
Answer: .....

- 22**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ .  $C$  is a point on the circle. Angle  $ATB = 80^\circ$ . Work out the size of angle  $ACB$ . Give a reason for each step.



Answer: .....

- 23**  $TA$  and  $TB$  are tangents to a circle with centre  $O$  and radius 5 cm.  $TA = 12$  cm. Work out the area of the kite  $OATB$ .

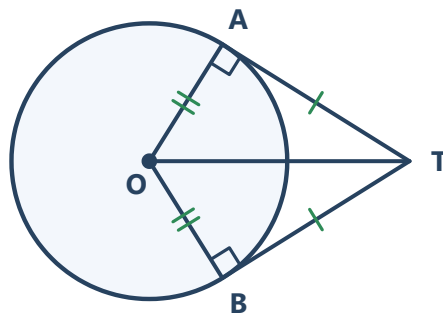


Answer: .....

- 24**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . Show that triangles  $OAT$  and  $OBT$  are congruent. Hence explain why  $OT$  bisects angle  $ATB$ .

Answer: .....

- 25**  $TA$  and  $TB$  are tangents to a circle with centre  $O$ . The line  $OT$  crosses the chord  $AB$  at  $M$ . Prove that  $OT$  is perpendicular to  $AB$ .



Answer: .....