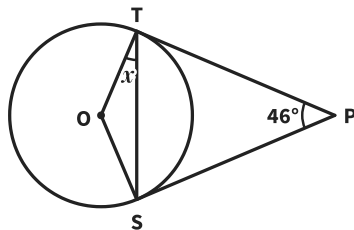


Circle Theorems: Tangents *stretch*

ANSWERS

1

PT and PS are tangents and O is the centre. Find angle OTS, marked x .



Not drawn accurately
angle $TOS = 360 - 90 - 90 - 46 = 134^\circ$
(tangent and radius)

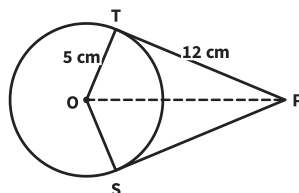
$$OT = OS: x = (180 - 134) \div 2$$

$$x = 23^\circ$$

Answer

2

PT and PS are tangents from P. The radius is 5 cm and $PT = 12$ cm. Find the perimeter of OTPS and the length OP.



Not drawn accurately
 $PS = PT = 12$ cm (tangents from a point):
 $5 + 12 + 12 + 5$

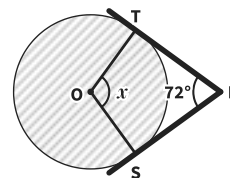
$$OTP = 90^\circ: OP = \sqrt{5^2 + 12^2} = 13$$

$$34 \text{ cm}, OP = 13 \text{ cm}$$

Answer

3

Two straight fences from a corner P just touch a round pond at T and S. The fences meet at 72° . O is the centre of the pond. Find angle TOS.



Not drawn accurately
angles OTP and OSP are 90° (tangent and radius)

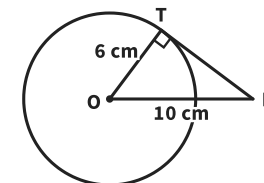
$$TOS = 360 - 90 - 90 - 72$$

$$TOS = 108^\circ$$

Answer

4

PT is a tangent at T. $OT = 6$ cm and $OP = 10$ cm. Mia says $PT = 10 - 6 = 4$ cm. Explain her mistake and find PT.



Not drawn accurately
 $OTP = 90^\circ$, so use Pythagoras with OP as the hypotenuse

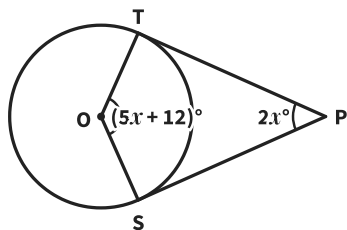
$$PT = \sqrt{10^2 - 6^2} = \sqrt{64}$$

$$PT = 8 \text{ cm}$$

Answer

5

PT and PS are tangents and O is the centre. Find the value of x .



Not drawn accurately
 $OTP = OSP = 90^\circ$ (tangent and radius)

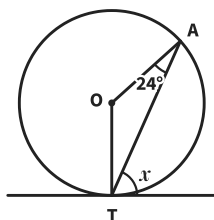
$$2x + 5x + 12 + 180 = 360, 7x = 168$$

$$x = 24$$

Answer

6

The line is a tangent at T and O is the centre. Find the angle between the tangent and TA, marked x .



Not drawn accurately
 $OT = OA$, so angle $OTA = 24^\circ$

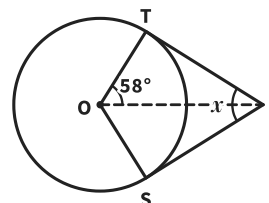
$$x = 90 - 24 \text{ (tangent and radius)}$$

$$x = 66^\circ$$

Answer

7

PT and PS are tangents and O is the centre. Angle $TOP = 58^\circ$. Find angle TPS, marked x .



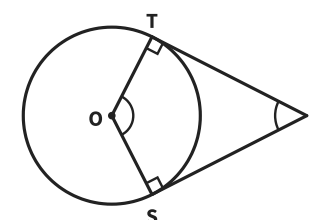
Not drawn accurately
 $OTP = 90^\circ$, so $TPO = 180 - 90 - 58 = 32^\circ$
triangles OTP and OSP are congruent, so
 $x = 2 \times 32$

$$x = 64^\circ$$

Answer

8

PT and PS are tangents and O is the centre. Explain why angle $TOS + \text{angle } TPS = 180^\circ$.



$OTP = OSP = 90^\circ$ (tangent and radius)
the angles of $OTPS$ add to 360° , so
 $TOS + TPS = 360 - 180$

$$TOS + TPS = 180^\circ$$

Reason