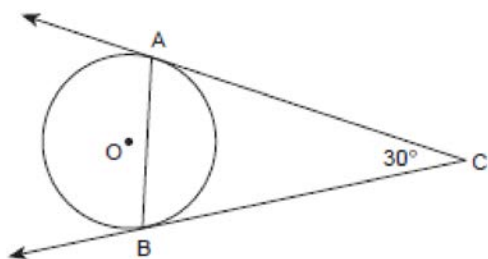


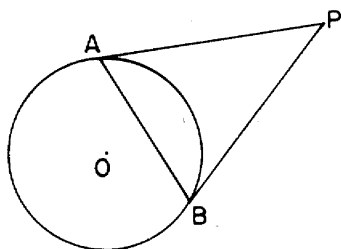
G.G.50: Tangents 2: Investigate, justify, and apply theorems about tangent lines to a circle: two tangents to a circle from the same external point

- 1 The accompanying diagram represents circular pond O with docks located at points A and B . From a cabin located at C , two sightings are taken that determine an angle of 30° for tangents \overline{CA} and \overline{CB} .

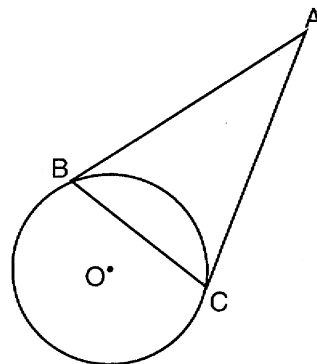


What is $m\angle CAB$?

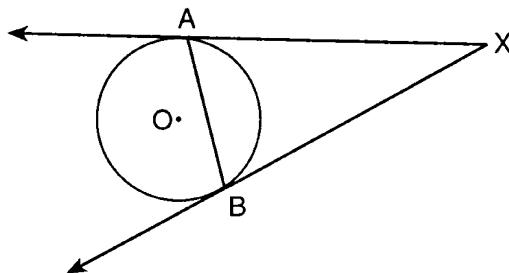
- 1) 30
 - 2) 60
 - 3) 75
 - 4) 150
- 2 From external point A , two tangents to circle O are drawn. The points of tangency are B and C . Chord \overline{BC} is drawn to form $\triangle ABC$. If $m\angle ABC = 66$, what is $m\angle A$?
- 1) 33
 - 2) 48
 - 3) 57
 - 4) 66
- 3 In the accompanying diagram, \overline{PA} and \overline{PB} are tangents drawn to circle O . If $m\angle PBA = 70$, find $m\angle P$.



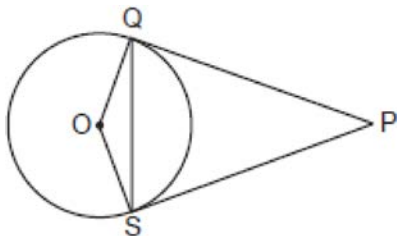
- 4 In the accompanying diagram, \overline{AB} and \overline{AC} are tangents to circle O , and chord \overline{BC} is drawn. If $m\angle ABC = 72$, what is $m\angle A$?



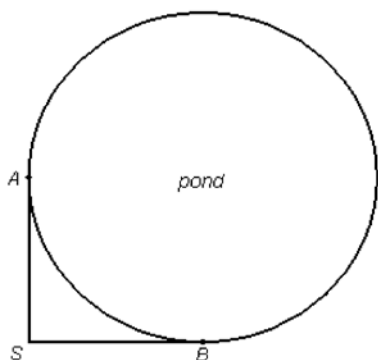
- 5 In the accompanying diagram of circle O , \overrightarrow{XA} and \overrightarrow{XB} are tangents and $m\angle XAB = 75$. Find $m\angle X$.



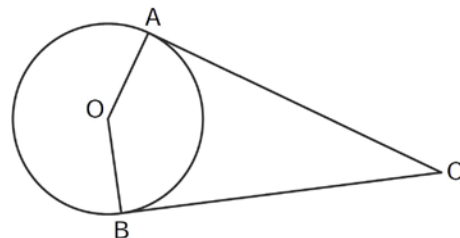
- 6 In the accompanying diagram, \overline{PQ} and \overline{PS} are tangents drawn to circle O , and chord \overline{QS} is drawn. If $m\angle P = 40$, what is $m\angle PQS$?



- 7 Two docks, A and B , are located on a circular pond as shown in the diagram below. A surveyor wants to determine the distance these two docks are from each other across the pond. The surveyor, located at point S , knows that he is 200 yards from both docks and his measuring equipment indicates that there is a 90° angle between his sight lines to dock A and to dock B . How far, to the nearest tenth of a yard, is it across the pond from dock A to dock B ?



- 8 In the diagram below, \overline{AC} and \overline{BC} are tangent to circle O at A and B , respectively, from external point C .



If $m\angle ACB = 38$, what is $m\angle AOB$?

- 1) 71
 - 2) 104
 - 3) 142
 - 4) 161
- 9 Tangents \overline{PA} and \overline{PB} are drawn to circle O from an external point, P , and radii \overline{OA} and \overline{OB} are drawn. If $m\angle APB = 40$, what is the measure of $\angle AOB$?
- 1) 140°
 - 2) 100°
 - 3) 70°
 - 4) 50°

G.G.50: Tangents 2: Investigate, justify, and apply theorems about tangent lines to a circle: two tangents to a circle from the same external point**Answer Section**

1 ANS: 3 REF: 010213b

2 ANS: 2
 $180 - 2(66) = 48$

REF: 061513ge

3 ANS:
40

REF: 018602siii

4 ANS:
36

REF: 089601siii

5 ANS:
30

REF: 019901siii

6 ANS:
70

REF: 080004siii

7 ANS:
282.8

REF: fall9926b

8 ANS: 3
 $180 - 38 = 142$

REF: 011419ge

9 ANS: 1 REF: 081012ge