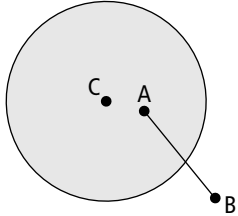


10.3 Tangents to a Circle

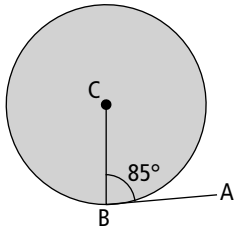
Check Your Understanding

Communicate the Ideas

1. Elliot says that AB is tangent to the circle because it touches the circle at 1 point. Is he correct? Circle YES or NO. Give 1 reason for your answer.



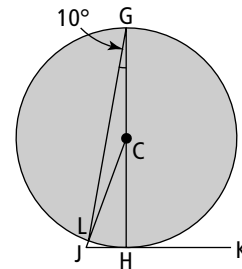
2. If BC is the radius, is AB tangent to the circle? Circle YES or NO. Give 1 reason for your answer.



Practise

3. Line segment JK is tangent to the circle at point H. GH is a diameter and $\angle CGL = 10^\circ$.

- a) $\triangle CGL$ is an _____ triangle.
(*equilateral or isosceles*)
Give 1 reason for your answer.



- b) What is the measure of $\angle HCL$?

$\angle HCL$ and $\angle HGL$ have the same arc, _____.

$\angle HCL$ is the _____ angle.

$\angle HGL$ is the _____ angle.

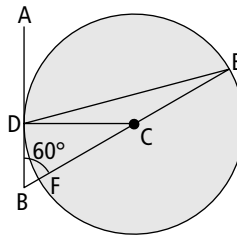
$\angle HCL = \angle HGL \times$ _____

$=$ _____

- c) What is the measure of $\angle GHJ$? _____

Give 1 reason for your answer.

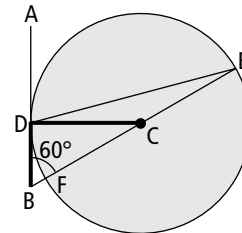
4. AB is tangent to the circle at point D.
 BE contains the diameter EF.
 $\angle ABE = 60^\circ$



- a) What is the measure of $\angle BDC$?
 Justify your answer.

Radius DC is _____ to tangent AB.

So, $\angle BDC$ is _____ $^\circ$.



- b) What is the measure of $\angle DCE$? Justify your answer.

The sum of the angles in a triangle is _____ $^\circ$.

$$\angle BDC + \angle DBC + \angle DCB = \text{_____}^\circ$$

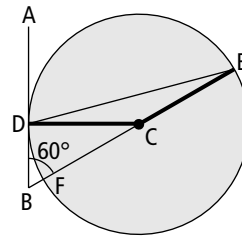
$$\text{_____}^\circ + \text{_____}^\circ + \angle DCB = \text{_____}^\circ$$

$$\angle DCB = \text{_____}^\circ$$

$\angle DCB$ and $\angle DCE$ make a straight angle.

$$\text{_____} + \angle DCE = 180^\circ$$

$$\angle DCE = \text{_____}$$



- c) What type of triangle is $\triangle CDE$? _____

- d) What is the measure of $\angle DEC$? How do you know?

Use the arc DF. $\angle DEF$ is an _____ angle.

$\angle DCF$ is the _____ angle.

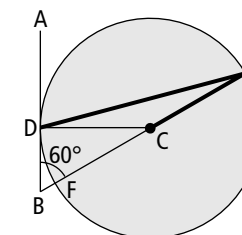
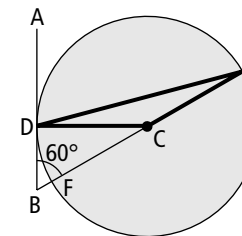
If $\angle DCF$ measures _____ $^\circ$, then $\angle DEF$ is half of that.

$$\angle DEF = \angle DCF \div \text{_____}$$

$$= \text{_____}^\circ \div \text{_____}$$

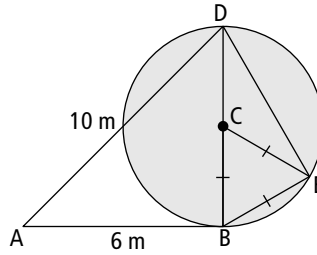
$$= \text{_____}^\circ$$

$\angle DEF = \angle DEC$, so, $\angle DEC$ is _____ $^\circ$.

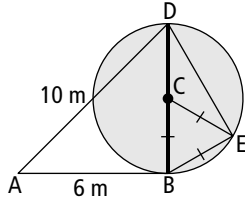


$\angle DCB = \angle DCF$

5. AB is tangent to the circle at point B.
 BD is a diameter of the circle.
 AB = 6 m
 AD = 10 m
 ΔBCE is an equilateral triangle.



- a) What is the length of diameter BD?
 Justify your answer.



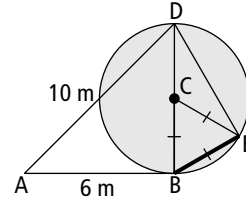
$\angle ABD$ is _____ $^\circ$ because AB
 is _____ to BD.

Formula \rightarrow

Substitute \rightarrow

Solve \rightarrow

- b) What is the length of chord BE?
 Justify your answer.



ΔBCE is an equilateral triangle.

diameter BD = _____ m

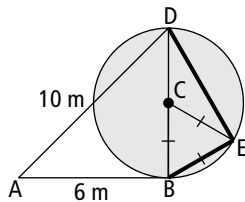
BC = BD \div _____

radius BC = _____ \div _____

BC = BE = CE

So, BE = _____ m.

- c) What is the measure of the inscribed angle $\angle BED$?



$\angle BCD$ is _____ $^\circ$.

$\angle BED$ is an inscribed angle.

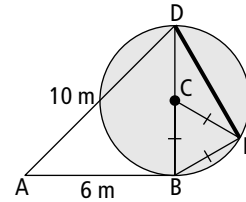
$\angle BED = \angle$ _____ \div _____

$\angle BED =$ _____ \div _____

$\angle BED =$ _____

So, $\angle BED$ is _____ $^\circ$.

- d) What is the length of chord DE to the nearest metre? Justify your answer.



Use ΔDEB .

Formula \rightarrow

Substitute \rightarrow

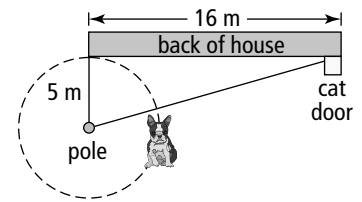
Solve \rightarrow

The length of DE is _____ m.

Name: _____

Date: _____

6. A dog is on a leash tied to a pole in the backyard.
The leash is 5 m long.
The back of the house is tangent to the circle at the edge of the house.



- a) What is the distance from the pole to the cat door?

Formula →

Substitute →

Solve →

The distance from the pole to the cat door is _____ m.

- b) How close can the dog get to the cat door?

Find the distance from the edge of the circle to the cat door.

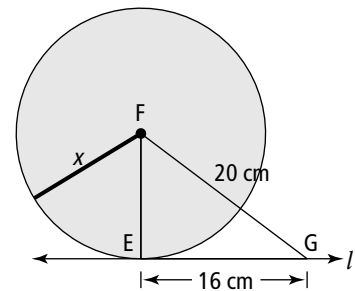
Sentence: _____

Apply

7. Line l is tangent to the circle.
Find the length of x in the diagram.
Write your answer to the nearest tenth (1 decimal place).

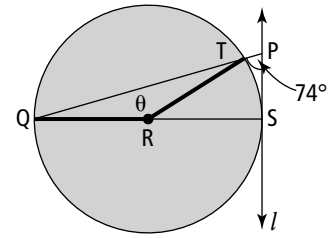
x is the same length as side _____ of $\triangle FEG$.

$\triangle FEG$ is a _____ triangle.



Sentence: _____

8. Find the measure of $\angle QRT$.
 SP is tangent to the circle at point S.
 RS is perpendicular to SP.
 $\angle SPQ = 74^\circ$



$\triangle PSQ$ is a _____ triangle, so $\angle PSQ$ is _____ $^\circ$.

The 3 angles in a triangle add up to _____ $^\circ$.

$\angle PQS + \text{_____} + \text{_____} = \text{_____}^\circ$

$\angle TQS$ is an inscribed angle to the central angle $\angle TRS$.

So, $\angle TRS = \angle PQS \times \text{_____}$

$\angle TRS = \text{_____}^\circ$

$\angle QRS = \text{_____}^\circ$ ∠QRS is a straight angle.

$\angle QRT + \angle TRS = \text{_____}^\circ$

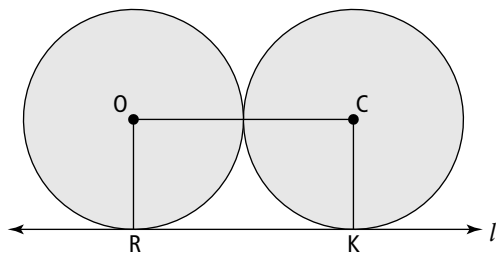
$\angle QRT + \text{_____}^\circ = \text{_____}^\circ$

$\angle QRT + \text{_____}^\circ - \text{_____}^\circ = \text{_____}^\circ - \text{_____}^\circ$

$\angle QRT = \text{_____}^\circ$

Sentence: _____.

9. The circles are exactly the same size.
 Line l is tangent to both circles.
 The radius is 5 cm.
 What is the perimeter of the rectangle? Label the diagram to show your explanation.



Sentence: _____.