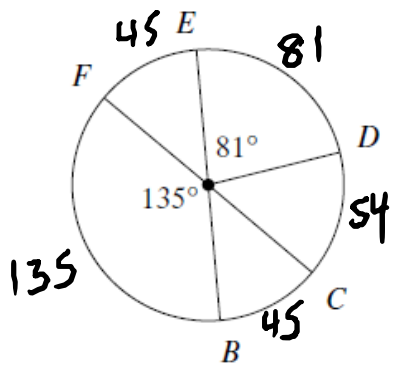
Warm Up

180
- 45
- 81
54

1.



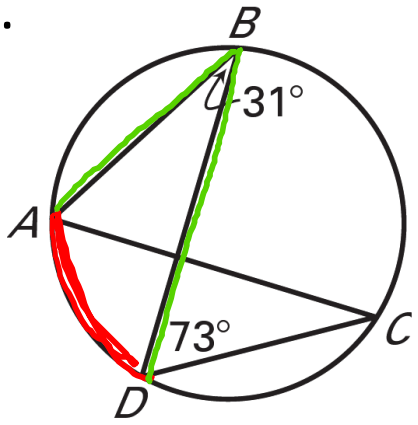
a. $m\widehat{CB} = 180 - 135 = 45$

b. $m\widehat{CBF} = 180$

c. $m\widehat{FD} = 45 + 81 = 126$

d. $m\widehat{DBF} = 135 + 45 + 54 = 234$

2.



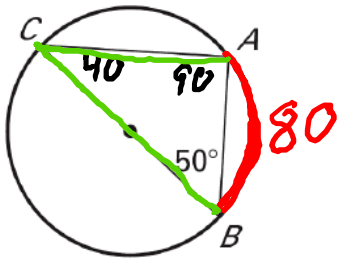
$m\angle A =$ 73

$m\angle C =$ 31

$m\widehat{BC} =$ 146

$m\widehat{AD} =$ 62

3.



180
- 90
- 50
40

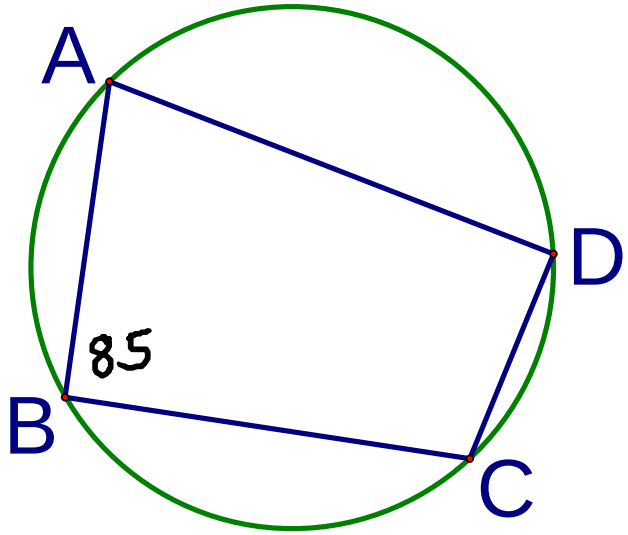
$m\angle C =$ 40

$m\widehat{AB} =$ 80

Inscribed Quadrilaterals

- If all the vertices of a polygon lie on a circle, the polygon is <u>inscribed</u> in the circle.

If $m\angle B = 85°$, what other measurements can you find?

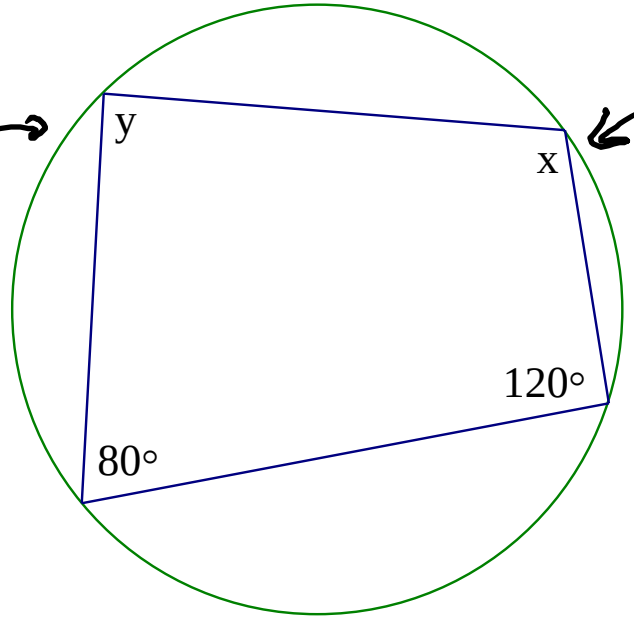


Thm. If a quadrilateral is inscribed in a circle, then opposite angles are supplementary. → add to 180

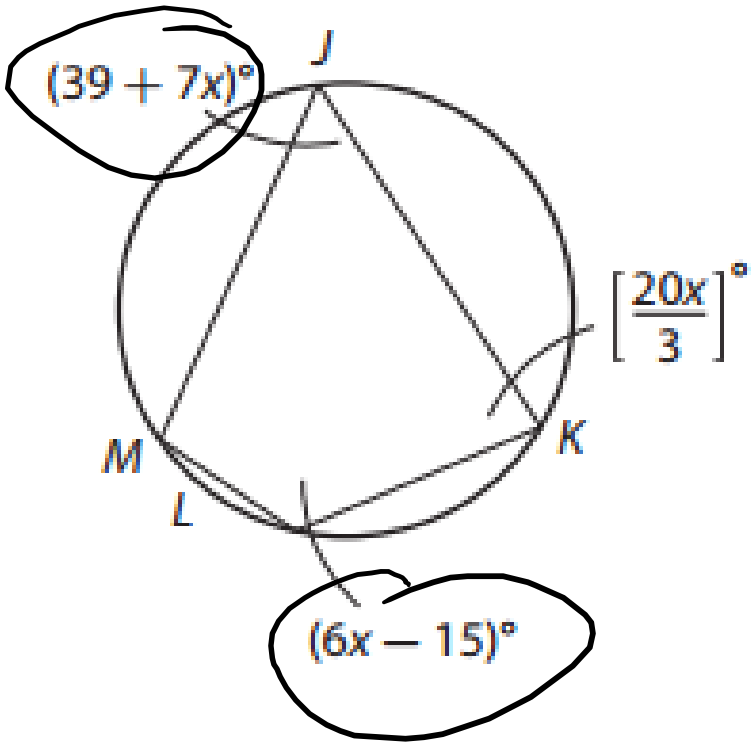
Ex. Find x and y.

180-120 = 60 →

← 180-80 = 100



Ex. Find x.



$39 + 7x + 6x - 15 = 180$

$13x + 24 = 180$

$-24 \quad -24$

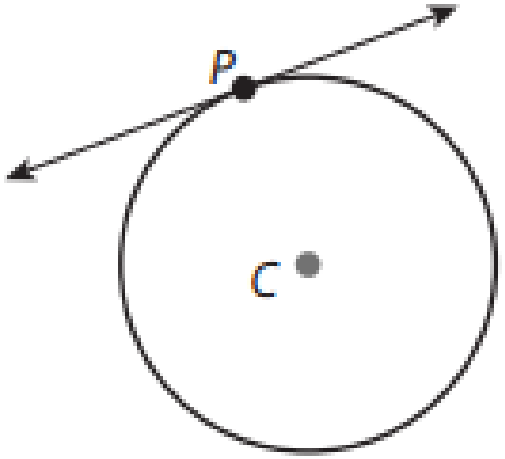
$\frac{13x}{13} = \frac{156}{13}$

$x = 12$

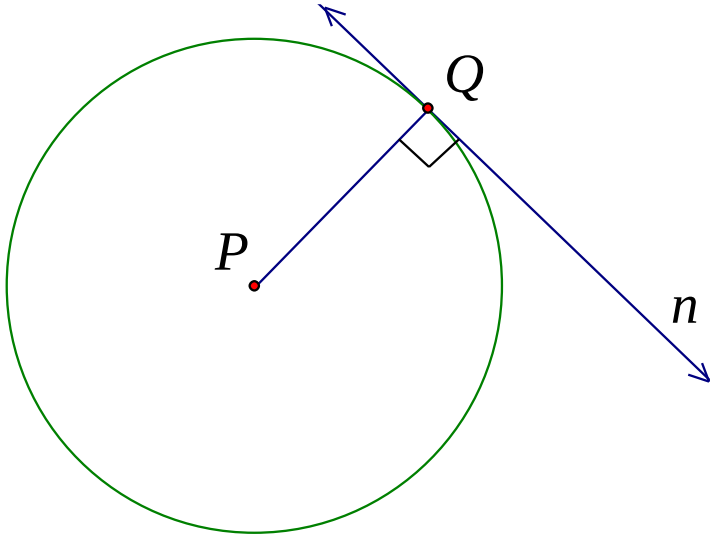
Tangents and Circumscribed Angles

Def. A tangent is a line that intersects the circle at exactly one point.

Def. The point at which a tangent line intersects a circle is the point of tangency.



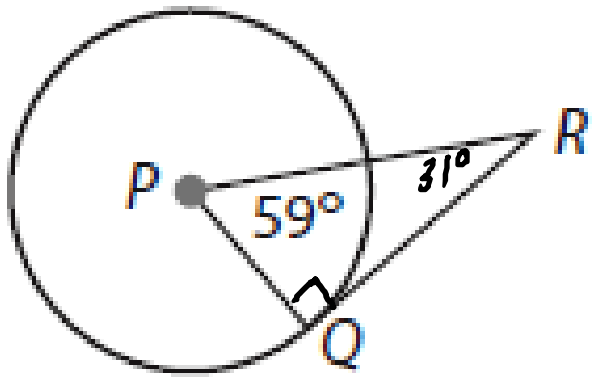
Thm. A tangent is perpendicular to the radius at the point of tangency.



$n \perp \overline{PQ}$

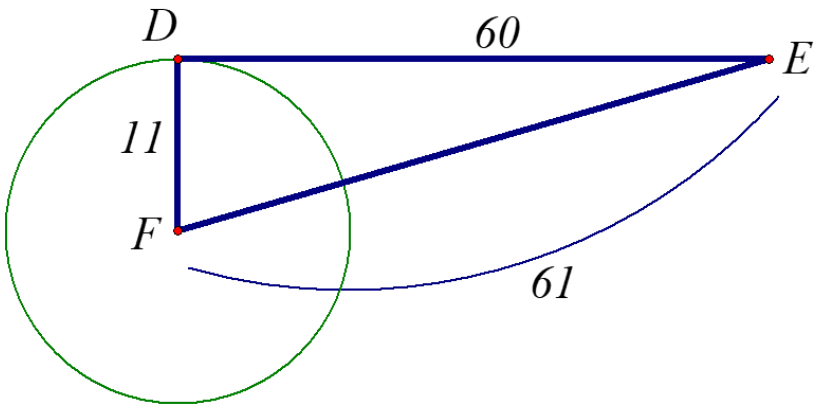
Ex. If $\overline{RQ}$ is tangent, find $m\angle R$.

$$\begin{array}{r} 180 \\ -59 \\ -90 \\ \hline 31 \end{array}$$

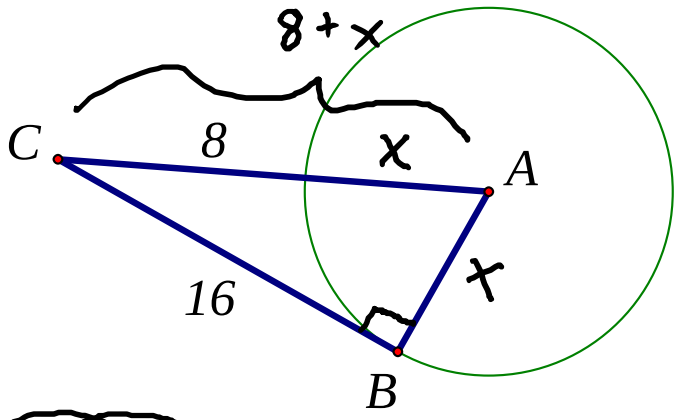


Ex. Show that $\overline{DE}$ is tangent to $\odot F$.

$a^2+b^2=c^2$



Ex. Find the radius of $\odot A$ if $\overline{BC}$ is tangent.



$a^2 + b^2 = c^2$

$x^2 + 16^2 = (8+x)^2$

$x^2 + 256 = 64 + 16x + x^2$

$-x^2 \quad -x^2$

$256 = 64 + 16x$

$-64 \quad -64$

$192 = 16x$

$\frac{192}{16} = \frac{16x}{16}$

$\boxed{x = 12}$

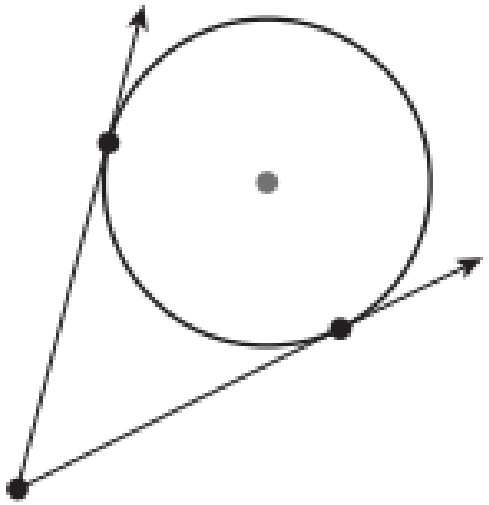
$(8+x)^2 = (8+x)(8+x)$

First
Outer
Inner
Last

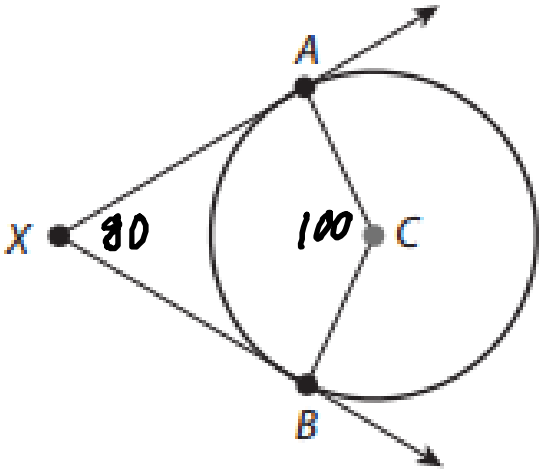
$= 64 + 8x + 8x + x^2$

$= 64 + 16x + x^2$

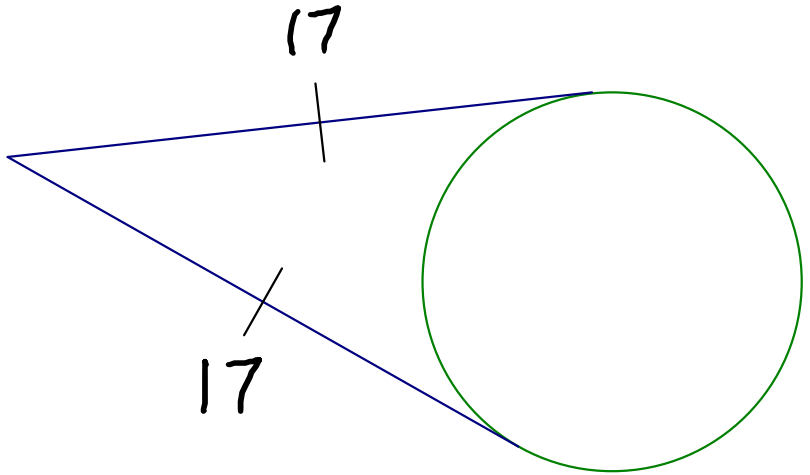
Def. A circumscribed angle is an angle formed by two lines that are tangent to the same circle.



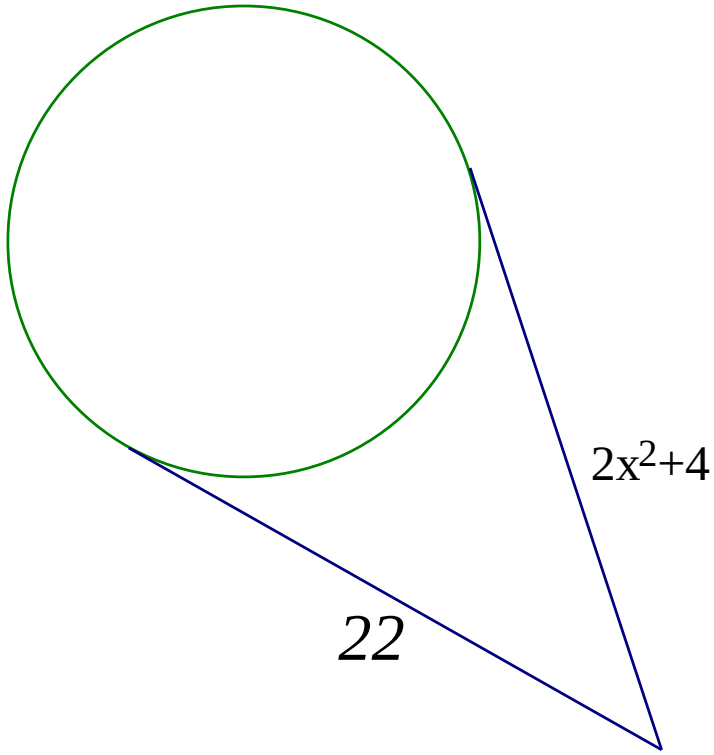
Thm. A circumscribed angle and its central angle are supplementary



Thm. If two segments come from the same exterior point and are tangent to the same circle, then they are congruent.



Ex. Find x.



Factoring

y^2 8

$(y+2)(y+4) \rightarrow y^2 + 6y + 8$

$2y$ $4y$

4 plus 2

4 times 2

Factoring means going the other direction

Ex. Factor $x^2 + 5x + 6 = (x + \underline{2})(x + \underline{3})$

add mult.

Ex. Factor $x^2 - 7x + 12 = (x + \underline{-4})(x + \underline{-3})$

add mult

Ex. Factor $x^2 + 10x - 24 = (x + \underline{12})(x + \underline{-2})$

add mult.

4

3

Pract. Factor $x^2 - 13x + 40$ = $(x + -8)(x + -5)$

add: -13 mult.: 40

Pract. Factor $x^2 - 7x - 30$ = $(x + -10)(x + 3)$

add: -7 mult.: -30

Pract. Factor $x^2 + 12x + 27$ = $(x + 9)(x + 3)$

add: 12 mult.: 27

Ex. Solve $x^2 + 5x + 6 = 0$

$(x+2)(x+3) = 0$

$x+2=0$ $\quad -2 \quad -2$

$x = -2$

$x+3=0$ $\quad -3 \quad -3$

$x = -3$

Note: "Factor" means your answer is the parentheses.
"Solve" means you aren't done until x equals a number

Ex. Solve $x^2 - 7x + 12 = 0$

$(x + -3)(x + -4) = 0$

$x - 3 = 0$ $\quad$ $x - 4 = 0$

$\boxed{x = 3}$ $\quad$ $\boxed{x = 4}$

Pract. Solve $x^2 + 10x - 24 = 0$

$(x + 12)(x + -2) = 0$

$x + 12 = 0$ $\quad$ $x - 2 = 0$

$\boxed{x = -12}$ $\quad$ $\boxed{x = 2}$