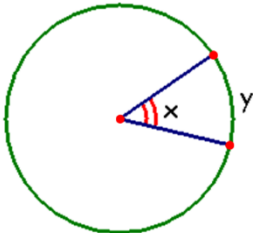
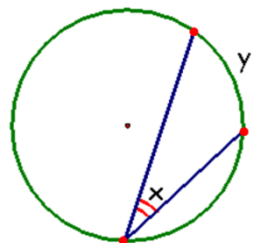
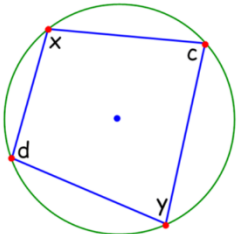
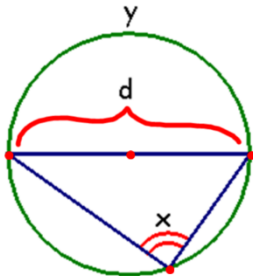
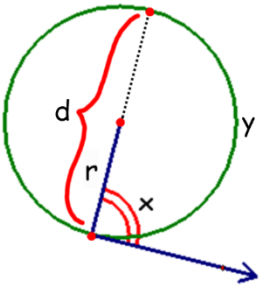
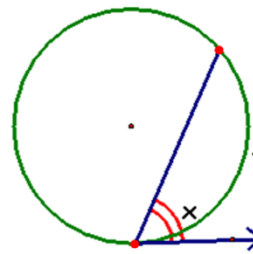
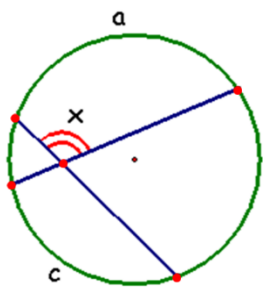
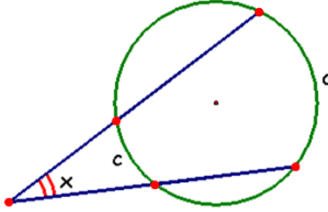
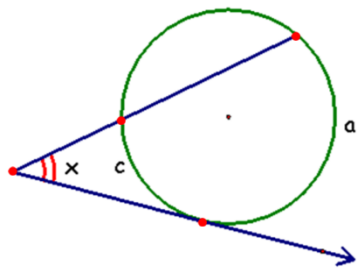


CIRCLES TOOLKIT

<p style="color: blue; text-align: center;">Vertex at the <u>CENTER</u> of the Circle</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: center;"> $x = y$ </div> </div>	<p style="color: blue; text-align: center;">Vertex <u>ON</u> the Circle</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: center;"> $x = \frac{1}{2}y$ $x = \frac{y}{2}$ $2x = y$ </div> </div>
<p style="color: blue; text-align: center;">Angles of an <u>INSCRIBED</u> quadrilateral</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: center;"> $x + y = 180$ $c + d = 180$ $x + c + y + d = 360$ </div> </div>	<p style="color: blue; text-align: center;">Vertex <u>ON</u> the Circle</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: center;"> $d = \text{diameter}$ $y = 180$ $x = 90$ </div> </div>
<p style="color: blue; text-align: center;">Vertex <u>ON</u> the Circle</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: center;"> $d = \text{diameter}$ $r = \text{radius}$ $y = 180$ $x = 90$ </div> </div>	<p style="color: blue; text-align: center;">Vertex <u>ON</u> the Circle</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: center;"> $x = \frac{1}{2}y$ $x = \frac{y}{2}$ $2x = y$ </div> </div>
<p style="color: blue; text-align: center;">Vertex <u>INSIDE</u> the Circle</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: center;"> $x = \frac{1}{2}(a + c)$ $x = \frac{a + c}{2}$ $2x = a + c$ </div> </div>	<p style="color: blue; text-align: center;">Vertex <u>OUTSIDE</u> the Circle</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: center;"> $x = \frac{1}{2}(a - c)$ $x = \frac{a - c}{2}$ $2x = a - c$ </div> </div>

Vertex OUTSIDE the Circle

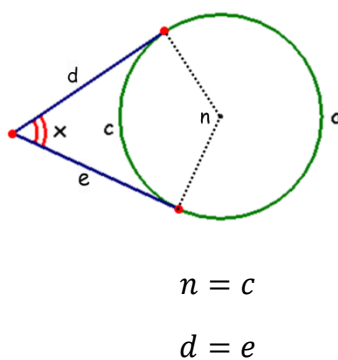


$$x = \frac{1}{2}(a - c)$$

$$x = \frac{a - c}{2}$$

$$2x = a - c$$

Vertex OUTSIDE the Circle



$$x = \frac{1}{2}(a - c)$$

$$x = \frac{a - c}{2}$$

$$2x = a - c$$

$$x + n = 180$$

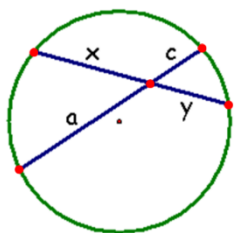
$$x + c = 180$$

$$a + c = 360$$

$$n = c$$

$$d = e$$

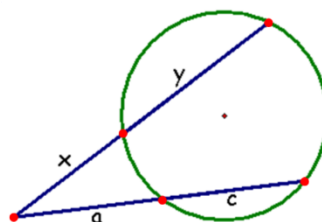
SEGMENT Lengths



$$\frac{x}{c} = \frac{a}{y}$$

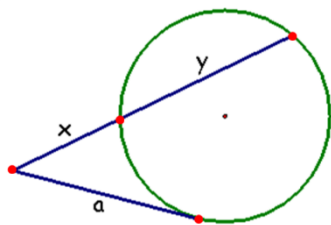
$$x \cdot y = a \cdot c$$

SEGMENT Lengths



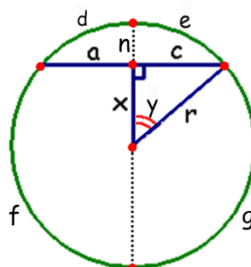
$$x(x + y) = a(a + c)$$

SEGMENT Lengths



$$x(x + y) = a^2$$

Diameter (or part of one) perpendicular to a chord



$$d = e$$

$$a = c$$

$$f = g$$

$$y = e$$

$$x + n = r$$

$$d + e = 2y$$

$$y = \frac{1}{2}(d + e)$$

$$y = \frac{d + e}{2}$$

$$d + f = 180$$

$$e + g = 180$$

$$d + e + g + f = 360$$

$$r = \text{radius}$$

$$a + c = \text{chord}$$

$$c^2 + x^2 = r^2$$

$$\frac{\sin(y)}{1} = \frac{c}{r}$$

$$\frac{\cos(y)}{1} = \frac{x}{r}$$

$$\frac{\tan(y)}{1} = \frac{c}{x}$$

$$\text{Circumference} = 2\pi r \text{ or } C = d\pi$$

$$\text{Arc length} = \frac{\text{degrees}}{360} \cdot \frac{2\pi r}{1} \text{ or } \frac{\text{degrees}}{360} \cdot \frac{d\pi}{1}$$

↳ (think "pizza crust")

$$\text{Area} = \pi r^2$$

$$\text{Area of a sector} = \frac{\text{degrees}}{360} \cdot \frac{\pi r^2}{1}$$

↳ (think "slice of pizza")

$$\text{Equation of a circle: } (x - h)^2 + (y - k)^2 = r^2$$

↳ Center is (h, k) and radius = r