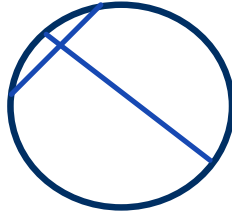
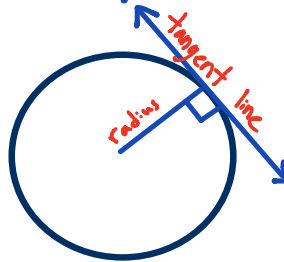


Segment Lengths and Volume

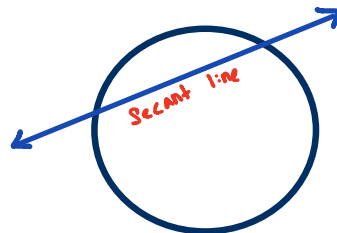
Chord- is a segment whose end points lie on the circumference of a circle.



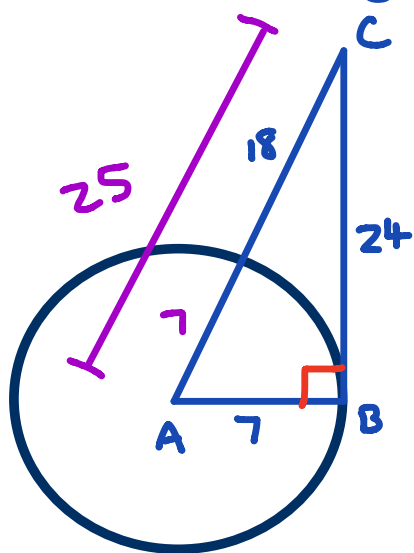
Tangent line- is a line that intersects a circle at exactly one point.



Secant line- is a line that intersects a circle at two points.



Ex.1 Determine whether BC is a tangent to circle A in the diagram below.



Is BC tangent to $\odot A$.

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

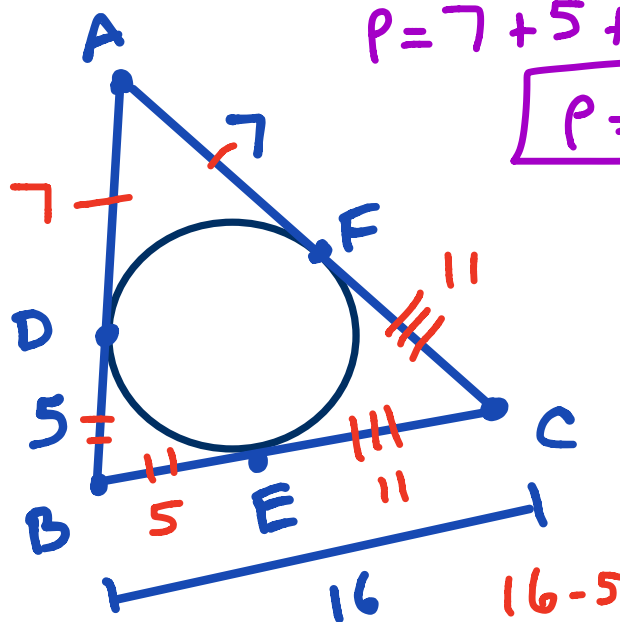
$$24^2 + 7^2 = 25^2$$

$$576 + 49 = 625$$

$$625 = 625 \checkmark$$

yes

Ex.2 each side of triangle ABC is tangent to circle O at the points D, E, and F. Find the perimeter of triangle ABC.

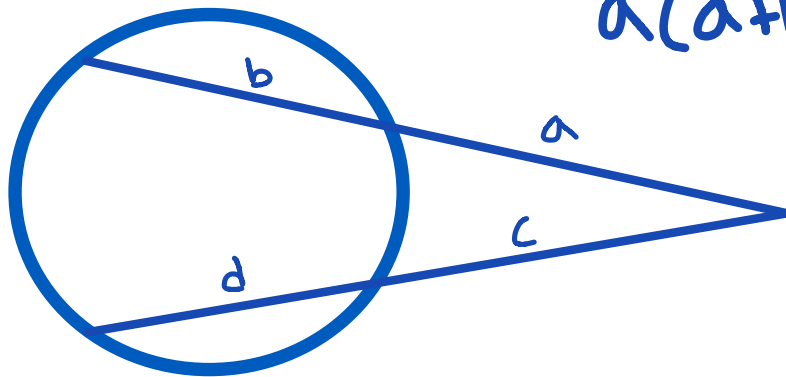


$$P = 7 + 5 + 5 + 11 + 11 + 7$$

$$P = 46$$

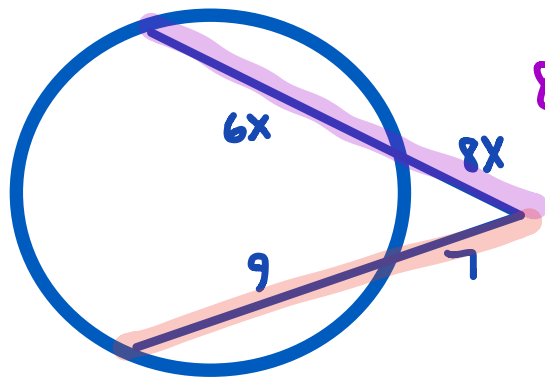
Segment lengths

(exterior)(whole) = (exterior)(whole)



$$a(a+b) = c(c+d)$$

Ex.1 Find x.



$$a(a+b) = c(c+d)$$
$$8x(8x+6x) = 7(7+9)$$

$$8x(14x) = 7(16)$$

$$\frac{112x^2}{112} = \frac{112}{112}$$

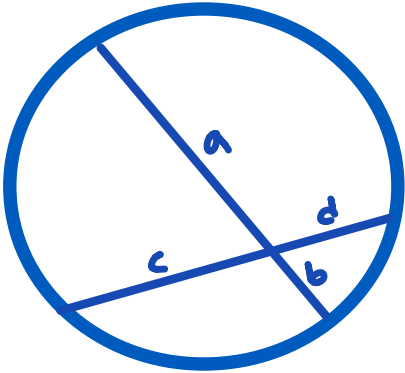
$$\sqrt{x^2} = \sqrt{1}$$

$$\boxed{x=1}$$

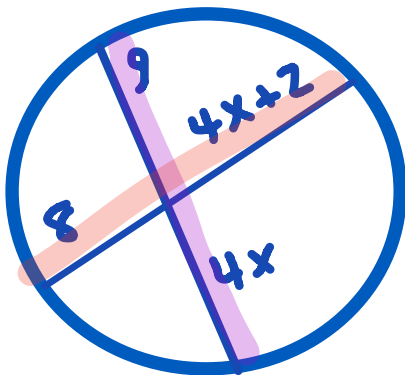
Chords

$$(a)(b) = (c)(d)$$

$$a(b) = c(d)$$



Ex.2 Find x.



$$\begin{aligned} a(b) &= c(d) \\ 9(4x) &= 8(4x+2) \\ 36x &= 32x + 16 \\ -32x &\quad -32x \end{aligned}$$

$$\begin{aligned} 4x &= 16 \\ \frac{4x}{4} &= \frac{16}{4} \end{aligned}$$

$$\boxed{x = 4}$$

Cross section - is a plane figure formed by the intersection of a plane and a solid surface.

Volume

not the same $\left\{ \begin{array}{l} b = \text{base} \\ B = \text{area of the base} \end{array} \right.$

$$V_{\text{prism}} = B \cdot h \quad \text{📦}$$

$$V_{\text{pyramid}} = \frac{1}{3} B \cdot h \quad \text{🏠}$$

$$V_{\text{cone}} = \frac{1}{3} \pi r^2 h \quad \text{🍷}$$

$$V_{\text{sphere}} = \frac{4}{3} \pi r^3 \quad \text{🎱}$$

$$V_{\text{cylinder}} = \pi r^2 h \quad \text{🥫}$$

Ex.1 Find the volume for a cylinder that has a height of 10 meters and a diameter of 4 meters.

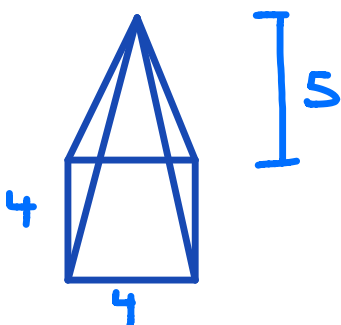


$$V = \pi r^2 \cdot h$$

$$V = \pi (2)^2 (10)$$

$$V = 40\pi \approx 125.7 \text{ m}^3$$

Ex.2 A square pyramid has a side length of 4 units and a height of 5 units. What is the volume of the pyramid?



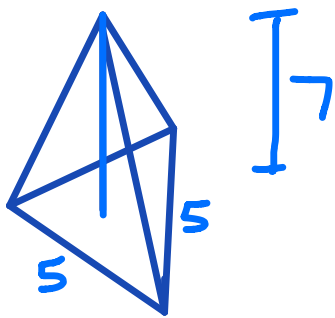
$$\begin{aligned} A &= b \cdot h \\ &= 4(4) \\ &= 16 \end{aligned}$$

$$V = \frac{1}{3} B \cdot h$$

$$V = \frac{1}{3} (16)(5)$$

$$V = 26.7 \text{ u}^3$$

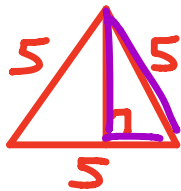
Ex.3 A triangular pyramid has a side length of 5 units and a height of 7 units. What is the volume of the pyramid?



$$V = \frac{1}{3} B \cdot h$$

$$V = \frac{1}{3} (10.75) (7)$$

$$V = 25.1 \text{ u}^3$$



$$A = \frac{1}{2} b \cdot h$$

$$= \frac{1}{2} (5) (4.3)$$

$$A = 10.75$$

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

$$a^2 + 2.5^2 = 5^2$$

$$a^2 + 6.25 = 25$$

$$\begin{array}{r} -6.25 \quad -6.25 \\ \hline \sqrt{a^2} = \sqrt{18.75} \end{array}$$

$$a = 4.3$$

Ex.4 Find the radius for a cylinder that has a volume of 45 m and a height of 5 m.

$$V = \pi r^2 h$$
$$\frac{45}{(5\pi)} = \frac{\cancel{\pi} r^2 (\cancel{5})}{(5\pi)}$$
$$\sqrt{2.9} = \sqrt{r^2}$$
$$\boxed{r = 1.7}$$
