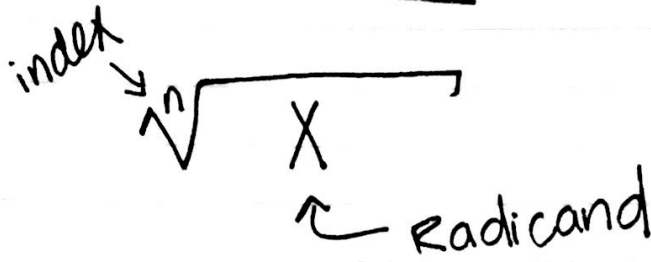


# Radicals



\* Simplify  $\rightarrow$  factor tree

\* Multiplying  $\rightarrow a\sqrt{b} \cdot c\sqrt{d} = ac\sqrt{bd}$

Simplify:

EX

①  $\sqrt{100} = 10$

②  $\sqrt{24} = 2\sqrt{3 \cdot 2} = \boxed{2\sqrt{6}}$

Factor tree for 24:  
 24  $\rightarrow$  6 and 4  
 6  $\rightarrow$  3 and 2  
 4  $\rightarrow$  2 and 2  
 Final factors:  $\boxed{3 \cdot 2}$  and  $\textcircled{2 \cdot 2}$

③  $\sqrt{250} = \boxed{5\sqrt{10}}$

Factor tree for 250:  
 250  $\rightarrow$  10 and 25  
 10  $\rightarrow$  2 and 5  
 25  $\rightarrow$  5 and 5  
 Final factors:  $\boxed{2 \cdot 5}$  and  $\textcircled{5 \cdot 5}$

④  $\sqrt[5]{32x^5} = \boxed{2x}$

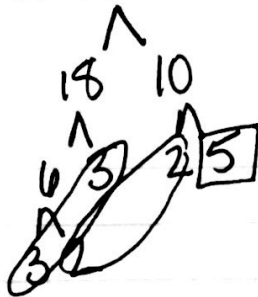
Factor tree for 32:  
 32  $\rightarrow$  8 and 4  
 8  $\rightarrow$  4 and 2  
 4  $\rightarrow$  2 and 2  
 Final factors:  $\textcircled{2 \cdot 2}$  and  $\textcircled{2 \cdot 2}$   
 Final result:  $\boxed{2x}$

④  $\sqrt{96} = 2 \cdot 2 \sqrt{6} = \boxed{4\sqrt{6}}$

Factor tree for 96:  
 96  $\rightarrow$  6 and 16  
 6  $\rightarrow$  3 and 2  
 16  $\rightarrow$  4 and 4  
 4  $\rightarrow$  2 and 2  
 Final factors:  $\textcircled{2 \cdot 2}$  and  $\textcircled{2 \cdot 2}$

Multiplying:

$$\textcircled{1} \sqrt{12} \cdot \sqrt{15} = \sqrt{180} = \boxed{6\sqrt{5}}$$



$$\textcircled{4} \sqrt{3} (\sqrt{6} + \sqrt{5})$$

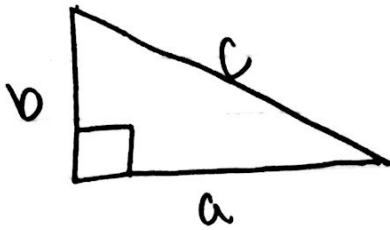
$$\sqrt{18} + \sqrt{15}$$

$9^{\wedge}2 \quad 5^{\wedge}3$

$$\boxed{3\sqrt{2} + \sqrt{15}}$$

# Pythagorean Theorem

\* Used to find missing sides of right triangles

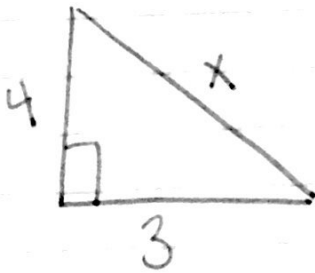


$$a^2 + b^2 = c^2$$

a and b → legs  
c → hypotenuse

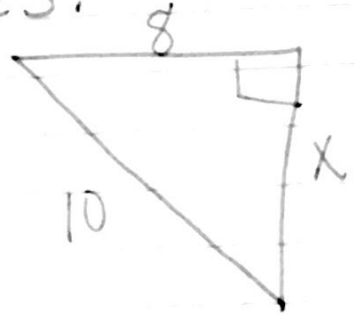
Find the missing sides:

①



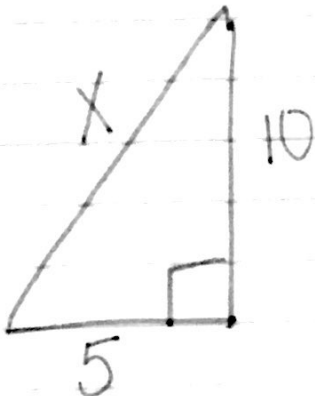
$$\begin{aligned} 3^2 + 4^2 &= x^2 \\ 9 + 16 &= x^2 \\ 25 &= x^2 \\ x &= \sqrt{25} \\ x &= 5 \end{aligned}$$

②



$$\begin{aligned} 8^2 + x^2 &= 10^2 \\ 64 + x^2 &= 100 \\ -64 & \quad -64 \\ x^2 &= 36 \\ x &= \sqrt{36} \\ x &= 6 \end{aligned}$$

③



$$\begin{aligned} 10^2 + 5^2 &= x^2 \\ 100 + 25 &= x^2 \\ 125 &= x^2 \\ x &= \sqrt{125} \end{aligned}$$

Simplified Radical

$\sqrt{55}$

decimal

Scanned by CamScanner

11.18