Numbers #6 Entire & Mixed Radicals

Sep 12

a mix of whole numbers and radicals

has groups of 2 prime factors

$\sqrt{12} = \sqrt{2 \cdot 2 \cdot 3} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$

$\sqrt{50} = \sqrt{2 \cdot 5 \cdot 5} = \sqrt{2} \cdot \sqrt{25} = 5\sqrt{2}$

$\sqrt{45} = \sqrt{3 \cdot 3 \cdot 5} = \sqrt{9} \cdot \sqrt{5} = 3\sqrt{5}$

Perfect Squares:

4
9
16
25
36
49
81
100

$4\sqrt{2} \rightarrow \sqrt{16} \cdot \sqrt{2} = \sqrt{32}$ ($4 = \sqrt{?}$)

$3\sqrt{7} \rightarrow \sqrt{9} \times \sqrt{7} = \sqrt{63}$ ($3 = \sqrt{?}$)

$\sqrt{320} \rightarrow \sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 5} = 2 \cdot 2 \cdot 2 \cdot \sqrt{5} = 8\sqrt{5}$

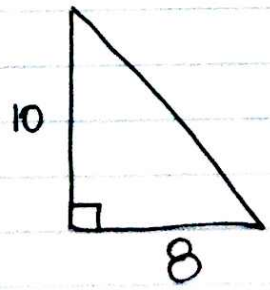
or $\sqrt{4} \cdot \sqrt{4} \cdot \sqrt{4} \cdot \sqrt{5}$

320 → 32, 10 → 8, 4, 25 → 2, 4, 2, 2

Application of $\sqrt{\ }$:

legs, hypotenuse

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



$10^2 + 8^2 = c^2$

$100 + 64 = c^2$

$164 = c^2$

$\sqrt{164} = c$

Write in simplest form (smallest numbers)

$\sqrt{4} \cdot \sqrt{41} = c$

$2\sqrt{41} = c$ ← exact value

Think:

164 → 2, 82 → 2, 41

$\therefore \sqrt{164} = \sqrt{2 \cdot 2 \cdot 41}$