
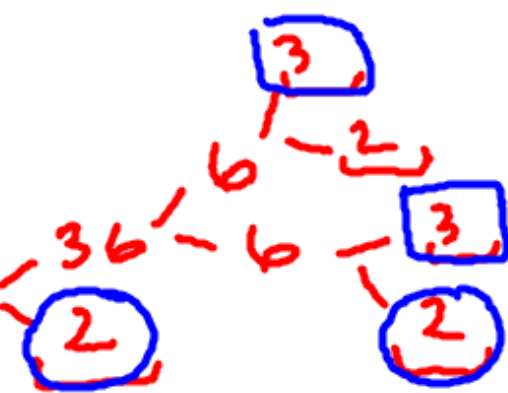


## Lesson 4.5/4.6: Simplifying Square Roots

$$\sqrt{20}$$


Factor tree for 20:  $20 = 2 \cdot 10 = 2 \cdot 2 \cdot 5$ . The prime factors 2 and 2 are circled in red.

$$2\sqrt{5}$$

$$\sqrt{72}$$


Factor tree for 72:  $72 = 2 \cdot 36 = 2 \cdot 2 \cdot 18 = 2 \cdot 2 \cdot 2 \cdot 9 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3$ . The prime factors 2, 2, 2, and 3 are circled in red.

$$3 \cdot 2\sqrt{2}$$

$$6\sqrt{2}$$

$$\sqrt{-98}$$

$$i\sqrt{98} = 7i\sqrt{2}$$

$$7i\sqrt{2}$$

$$\sqrt{-120}$$

$$i\sqrt{120} = 2i\sqrt{3 \cdot 2 \cdot 5} = 2i\sqrt{30}$$

$$2i\sqrt{30}$$

$$\underline{3}\sqrt{5} \cdot \underline{2}\sqrt{75}$$

$$3 \cdot 2 \sqrt{5 \cdot 75}$$

$$6 \sqrt{375} \begin{array}{l} \swarrow 5 \\ \searrow 75 \end{array} \begin{array}{l} \swarrow 5 \\ \searrow 15 \end{array} \begin{array}{l} \swarrow 5 \\ \searrow 3 \end{array}$$

$$6 \cdot 5 \sqrt{5 \cdot 3}$$

$$\boxed{30\sqrt{15}}$$

$$\sqrt{x^2} = \sqrt{80}$$

$$x = \pm \sqrt{80}$$



$$x = \pm 4\sqrt{5}$$

$$x^2 + 36 = 8$$

$-36 \quad -36$

$$\sqrt{x^2} = \sqrt{-28}$$

$$x = \pm \sqrt{-28}$$

$$x = \pm i\sqrt{28}$$

$\swarrow$  2  $\searrow$  14  $\swarrow$  7  $\searrow$  2

$$x = \pm 2i\sqrt{7}$$

$$3x^2 - 10 = x^2 + 240$$

$$4x^2 - 1 = 3$$

+1   +1

$$\frac{4x^2}{4} = \frac{4}{4}$$

$$\sqrt{4} = \frac{2}{2}$$

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

$$x = \pm \sqrt{1}$$

$$x = \pm 1$$

$$\underline{(2 + 3i)} - (\underline{1 - i})$$

$$1 + 4i$$

$$a + bi$$