

12/2 Alg. II B4 A.A.

Difference of two squaring

- = difference

ex:

$$\textcircled{4x^2} - \textcircled{16}$$

↓ ↓
squares

ex:

$$(x^2 - 4)$$

$$(x+2)(x-2)$$

$$x^2 - \textcircled{2x+2x} - 4$$

$$x^2 - 4$$

ex:

$$12x^2 - 3$$

$$3(4x^2 - 1)$$

$$(2x-1)(2x+1)$$

ex:

$$\cancel{x^2} x^4 - 16$$

$$(x^2 - 4)(x^2 + 4)$$

$$(x - 2)(x + 2)(x^2 + 4)$$

B4 Alg. II 12/20/11 A.A.

Solving Quadratic Functions using square roots

$$2^2 = 4$$

$$\sqrt{4} = (\pm)2$$

$$\boxed{\sqrt{x^2} = \pm x}$$

Product Property of Radicals

$$\boxed{\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}}$$

$$\text{ex: } \sqrt{8} = \sqrt{4} \cdot \sqrt{2} \xrightarrow{\quad \downarrow \quad} 2\sqrt{2}$$

$$\sqrt{8} = 2\sqrt{2}$$

↓
simplified

$$\text{ex: } \sqrt{24}$$

Possible ways to reduce

$$\sqrt{8} \cdot \sqrt{3}$$

$$\sqrt{12} \cdot \sqrt{2} \rightarrow \sqrt{4} \cdot \overset{\sqrt{6}}{\sqrt{3} \cdot \sqrt{2}}$$

$$\sqrt{6} \cdot \sqrt{4} \rightarrow \sqrt{4} \cdot \sqrt{6}$$

$$\downarrow \\ 2\sqrt{6}$$

→ BEST WAY
TO SIMPLIFY
TERM

Example: $\sqrt{48}$

Possible ways
to simplify

$$\sqrt{2} \cdot \sqrt{24} \rightarrow \sqrt{6} \sqrt{4} \sqrt{2}$$

$$\sqrt{4} \cdot \sqrt{12} \rightarrow 2\sqrt{3} \sqrt{4}$$

$$\sqrt{6} \cdot \sqrt{8} \rightarrow \sqrt{4} \sqrt{2} \sqrt{6}$$

$$\sqrt{3} \cdot \sqrt{16} \rightarrow 4\sqrt{3}$$

→ Best/Quickest way
to simplify

Quotient Property of Radicals

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

Example: $\sqrt{\frac{36}{9}}$

$$\sqrt{\frac{36}{9}}$$

← Find the square root
of each
term

$$\frac{\sqrt{36}}{\sqrt{9}}$$

← answer

$$\frac{6}{3}$$

$$\textcircled{2}$$

} simplify

Example: $\sqrt{\frac{24}{18}}$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$\frac{\sqrt{24}}{\sqrt{18}}$$

$$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$$

$$\frac{\sqrt{6} \sqrt{4}}{\sqrt{9} \sqrt{3}}$$

cancel out

$$\frac{\sqrt{4}}{\sqrt{3}}$$

answer

$$\frac{2}{\sqrt{3}}$$

simplified

$$2x + x + 3x + x = 7x$$

$$2\sqrt{2} + \sqrt{2} + 3\sqrt{2} + \sqrt{2} = 7\sqrt{2}$$

$$2x + y + 3x + 2y + x = 6x + 3y$$

can't
combine
unlike
terms

$$2\sqrt{2} + \sqrt{3} + 3\sqrt{2} + 2\sqrt{3} + \sqrt{2} = 6\sqrt{2} + 3\sqrt{3}$$

combine like terms

Example: $3\sqrt{2} - 2\sqrt{2} + 3\sqrt{3} - 3\sqrt{3}$

$\sqrt{2}$

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

$$\sqrt{(x+1)^2} = \pm (x+1)$$

$$2x^2 + 1 = 17$$

$$2x^2 = 16$$

$$\sqrt{x^2} = \sqrt{8}$$

$$\sqrt{x^2} = \pm \sqrt{8}$$

$$x = \pm \sqrt{8}$$

$$x = \pm \sqrt{4} \sqrt{2}$$

$$x = \pm 2\sqrt{2} \leftarrow \text{roots}$$

in order to graph, make radical to decimal

Example: $\frac{3}{\sqrt{3}} (x+5)^2 = 7.3$

↑ cancels out

square root
cancels out → $\sqrt{(x+5)^2} = \sqrt{21}$

$$x+5 = \pm\sqrt{21}$$

$$x = -5 \pm \sqrt{21}$$