

Final Review #6 : Quadratic Equations

Simplify Radical

$\sqrt{108}$ $= \sqrt{9 \cdot 12}$ $= \sqrt{9 \cdot 4 \cdot 3}$ $= 3 \cdot 2 \sqrt{3}$ $= 6\sqrt{3}$	$\sqrt{108}$ $= \sqrt{4 \cdot 27}$ $= \sqrt{4 \cdot 9 \cdot 3}$ $= 2 \cdot 3 \cdot \sqrt{3}$ $= 6\sqrt{3}$
$\sqrt{112}$ $= \sqrt{56 \cdot 2}$ $= \sqrt{8 \cdot 7 \cdot 2}$ $= \sqrt{4 \cdot 2 \cdot 7 \cdot 2}$ $= 2 \cdot 2 \cdot \sqrt{7}$ $= 4\sqrt{7}$	$\sqrt{112}$ $= \sqrt{4 \cdot 28}$ $= \sqrt{4 \cdot 4 \cdot 7}$ $= 4\sqrt{7}$

Solve by Taking Square Roots

$3x^2 - 10 = 23$ $3x^2 = 33$ $x^2 = 11$ $x = \{ \pm \sqrt{11} \}$	$3x^2 + 29 = 23$ $3x^2 = -6$ $x^2 = -2$ $x = \pm \sqrt{-2}$ <p style="text-align: center; color: green;">↑ not a real #</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="margin: 0;">NO REAL SOLUTION</p> </div>
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Solve by Factoring

$$\begin{array}{r} x^2 - 2x = 2x + 21 \\ -21 \quad -2x \quad -2x - 21 \\ \hline \end{array}$$

$$x^2 - 4x - 21 = 0$$

$$(x-7)(x+3) = 0$$

$$x-7=0 \text{ or } x+3=0$$

$$x=7 \quad x=-3$$

$$x = \{7, -3\}$$

$$\begin{array}{r} 2x^2 = 4x - 2 \\ -4x + 2 \quad -4x + 2 \\ \hline \end{array}$$

$$\frac{2x^2 - 4x + 2}{2} = \frac{0}{2}$$

$$x^2 - 2x + 1 = 0$$

$$(x-1)(x-1) = 0$$

$$x-1=0$$

$$x=1$$

Solve by Quadratic Formula

$$2x^2 - 3x + 4 = 0$$

$$a=2 \quad b=-3 \quad c=4$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(4)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{9-32}}{4} \leftarrow \text{negative}$$

no real solution

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

$$-10 \quad -10$$

$$x^2 - 10x + 2 = 0$$

$$a=1 \quad b=-10 \quad c=2$$

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(2)}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{100-8}}{2}$$

$$x = \frac{10 \pm \sqrt{92}}{2}$$

$$\begin{aligned} &\frac{\sqrt{92}}{2} \\ &= \sqrt{4 \cdot 23} \\ &= 2\sqrt{23} \end{aligned}$$

$$x = \frac{10 \pm 2\sqrt{23}}{2}$$

$$x = \{5 \pm \sqrt{23}\}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$