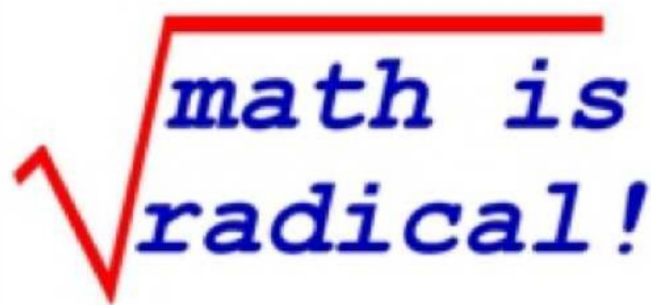


1.5 Solving Quadratic Equations Using Square Roots



*math is
radical!*

Solving Quadratics By Taking Square Roots

*Use solving by taking square roots when...

$$X^2 = C$$

$$(x \pm a)^2 = C$$

ex: Solve.

a) $3x^2 + 5 = 41$

$$3x^2 = 36$$

$$\sqrt{x^2} = \sqrt{12}$$

$$|x| = \sqrt{12}$$

$$x = \pm \sqrt{12}$$

$$x = \pm 2\sqrt{3}$$

$$\frac{\sqrt{(-4)^2}}{\sqrt{4^2}}$$

$$b) 4(x-2)^2 + 32 = 0$$

$$4(x-2)^2 = -32$$

$$i\sqrt{8}$$

$$\sqrt{(x-2)^2} = \sqrt{-8}$$

$$|x-2| = 2i\sqrt{2}$$

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

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

↑
front!

$$c) 3x^2 - 1 = 0$$

$$\sqrt{x^2} = \sqrt{\frac{1}{3}} \cdot \sqrt{3}$$

$$|x| = \frac{\sqrt{3}}{3}$$

$$x = \pm \frac{\sqrt{3}}{3}$$

$$d) 5x^2 - 8 = -8$$

$$5x^2 = 0$$

$$\sqrt{x^2} = \sqrt{0}$$

$$|x| = 0$$

$$x = 0; \text{mult. of } 2$$

$$\begin{aligned} e.) \quad & 3(x+5)^2 + 5 = 3 \\ & \sqrt{(x+5)^2} = \sqrt{\frac{-2}{3} \cdot \frac{\sqrt{3}}{\sqrt{3}}} \\ & |x+5| = \frac{\sqrt{-6}}{3} \\ & |x+5| = \frac{i\sqrt{6}}{3} \\ & x+5 = \pm \frac{i\sqrt{6}}{3} \\ & x = -5 \pm \frac{i\sqrt{6}}{3} \end{aligned}$$

$$f.) \quad 4(x+3)^2 + 1 = 49$$

$$\sqrt{(x+3)^2} = \sqrt{12}$$

$$|x+3| = \sqrt{12}$$

$$x+3 = \pm \sqrt{12}$$

$$x = -3 \pm 2\sqrt{3}$$

$$g.) \quad 3(x-4)^2 + 14 = 5$$

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

$$|x-4| = i\sqrt{3}$$

$$x-4 = \pm i\sqrt{3}$$

$$x = 4 \pm i\sqrt{3}$$

Review

ex: Simplify.

$$\sqrt{98} + \sqrt{18}$$

Review

ex: Simplify.

$$i^{2018}$$

Review

ex: Write a quadratic equation with roots $x=5/2$ and $x=-3$.

Review

ex: Simplify.

$$\frac{4i}{2i-1}$$