January 3

Unit 1 Bare Necessities - Quadratics and Piecewise

Simplifying Radicals

EX1. $\sqrt{20}$

4 5

2 2

$\sqrt{\cancel{2\cdot 2}\cdot 5}$

$\boxed{2\sqrt{5}}$

EX2. $\sqrt{-600}$

$i\sqrt{600}$

6 100

2 3 10 10

2 5 2 5

$i\sqrt{\cancel{2\cdot 2}\cdot 2\cdot 3\cdot \cancel{5\cdot 5}}$

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

$\boxed{10i\sqrt{6}}$

Solving Quadratic Equations Using the Quadratic Formula

EX3. $m^2 - 5m - 14 = 0$

a: 1 b: −5 c: −14

$m = \dfrac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(-14)}}{2(1)}$

$m = \dfrac{5 \pm \sqrt{81}}{2}$ → $\sqrt{81}$

9

$m = \dfrac{5 \pm 9}{2}$

$m = \dfrac{5+9}{2}, \dfrac{5-9}{2}$

$\boxed{m = 7, -2}$

EX4. $x^2 - 4x = -9$

$+9 \quad +9$

$x^2 - 4x + 9 = 0$

a: 1 b: −4 c: 9

$x = \dfrac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(9)}}{2(1)}$

$x = \dfrac{4 \pm \sqrt{-20}}{2}$ → $\sqrt{-20}$

$i\sqrt{20}$

4 5

2 2

$i\sqrt{\cancel{2\cdot 2}\cdot 5}$

$2i\sqrt{5}$

$x = \dfrac{4 \pm 2i\sqrt{5}}{2}$ ÷2 ÷2 ÷2

$x = \dfrac{2 \pm 1i\sqrt{5}}{1}$

$x = 2 \pm 1i\sqrt{5}$

$\boxed{x = 2 \pm i\sqrt{5}}$

EX5. $8n^2 - 18 = 4n$

Vertex of a Parabola

EX6. $y = 2x^2 + 10x - 4$

a:2 b:10 c:-4

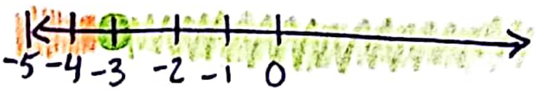
$$x = \frac{-(10)}{2(2)} = -\frac{5}{2}$$

$$y = 2\left(-\frac{5}{2}\right)^2 + 10\left(-\frac{5}{2}\right) - 4 = -\frac{33}{2}$$

$$\boxed{\left(-\frac{5}{2}, -\frac{33}{2}\right)}$$

Evaluate Piecewise Functions

$$f(x) = \begin{cases} 3x - 9, & x < -3 \\ 8x^2, & x \geq -3 \end{cases}$$



EX7. $f(8) = 8(8)^2 = \boxed{512}$

EX8. $f(-10) = 3(-10) - 9 = \boxed{-39}$

EX9. $f(-3) = 8(-3)^2 = \boxed{72}$

EX10. $f(-1) = 8(-1)^2 = \boxed{8}$