

Section 4.3 and 4.4 – Checking Your understanding

Answer the following four questions, show as many steps as you need to, write clearly and neatly.

1. Solve using the Square Root Method

$$\sqrt{\left(x + \frac{2}{3}\right)^2} = \pm \sqrt{\frac{5}{9}}$$

$$x + \frac{2}{3} = \pm \sqrt{\frac{5}{9}}$$

$$x + \frac{2}{3} = \pm \frac{\sqrt{5}}{\sqrt{9}}$$

$$x + \frac{2}{3} = \pm \frac{\sqrt{5}}{3}$$

$$x = -\frac{2}{3} \pm \frac{\sqrt{5}}{3}$$

$$x = \frac{-2 \pm \sqrt{5}}{3}$$

2. Complete the square and then solve using the Square Root Method

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$$(2x + 5)(x - 3) = (x + 4)(x - 1)$$

$$2x^2 - 6x + 5x - 15 = x^2 - x + 4x - 4$$

$$2x^2 - x - 15 = x^2 + 3x - 4$$

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

$$(x^2 - 4x) - 11 = 0$$

$$(x^2 - 4x + 4 - 4) - 11 = 0$$

$$(x^2 - 4x + 4) - 4 - 11 = 0$$

$$(x - 2)^2 - 15 = 0$$

$$(x - 2)^2 = 15$$

$$x - 2 = \pm \sqrt{15}$$

$$x = 2 \pm \sqrt{15}$$

3. Solve using the Quadratic Equation:

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

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

$2x^2 - 2x - 1 = 0$ $-1 \quad (-2x^2 + 2x + 1) = 0 \cdot -1$

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

$$\frac{2 \pm \sqrt{4 - (-8)}}{4} = \frac{2 \pm \sqrt{12}}{4}$$

$$\frac{2 \pm 2\sqrt{3}}{4} = \frac{1 \pm \sqrt{3}}{2}$$

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

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

$$\frac{-2 \pm \sqrt{4 - (-8)}}{-4} \rightarrow \frac{-2 \pm \sqrt{12}}{-4}$$

$$\frac{-2 \pm 2\sqrt{3}}{-4} = \frac{1 \pm \sqrt{3}}{2}$$

4. Find the Vertex by Completing the Square, the x -intercepts (if possible), y -intercepts, and the domain and the range. Graph it.

$f(x) = -2x^2 - 12x - 10$

$y = -2(x^2 + 6x + 5)$

$0 = -2(x+1)(x+5)$

$(-2x^2 - 12x) - 10$

$-2(x^2 + 6x) - 10$

$-2(x^2 + 6x + 9 - 9) - 10$

$-2(x^2 + 6x + 9) + 18 - 10$

$-2(x+3)^2 + 8$

y -int: $(0, -10)$
 x -int: $(-5, 0)$
 $(-1, 0)$

