Name: **KEY**   Date: _____

Math 1050 PRACTICE Quiz#2 (4.3-5.4)

1. Solve the following inequality and state the solution in interval notation.

$$2x^2 + x \geq 3$$
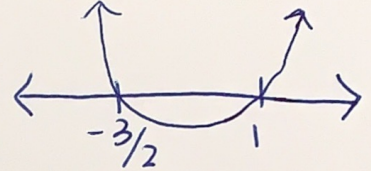$$-3 \quad -3$$
$$2x^2 + x - 3 \geq 0$$

$$(2x+3)(x-1) = 0$$

$$2x+3 = 0 \qquad x-1 = 0$$
$$\quad -3 \ -3 \qquad +1 \ +1$$
$$\frac{2x}{2} = \frac{-3}{2} \qquad x = 1$$

$$x = -\frac{3}{2}$$

x	-1
$2x$	$2x^2$	$-2x$
3	$+3x$	-3

$$\begin{array}{c} + \\ 1 \ | -6 \end{array}$$

$$\boxed{(-\infty, -\tfrac{3}{2}] \cup [1, \infty)}$$

2. Solve the following inequality and state the solution in interval notation.

$$\frac{3}{x+1} < \frac{4}{x-2}$$

$$\frac{3}{x+1} - \frac{4}{x-2} < 0$$

$$\frac{3(x-2)}{(x-2)(x+1)} - \frac{4(x+1)}{(x-2)(x+1)} < 0$$

$$\frac{3x-6-4x-4}{(x-2)(x+1)} < 0$$

$$\frac{-x-10}{(x-2)(x+1)} < 0 \quad \underset{\text{not a}}{\underset{\text{bracket}}{\nearrow}}$$
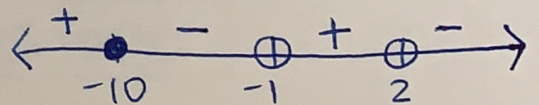
x-int:
$$0 = -x - 10$$
$$+x \qquad +x$$
$$x = -10$$

undefined x's:
$$x \neq -1$$
$$x \neq 2$$

$$\boxed{(-10, -1) \cup (2, \infty)}$$

An appliance wholesaler finds the number x appliances she can sell each week is related to the price p by the equation $x = 1500 - p$, $\quad 0 \le p \le 1500$. What is the maximum revenue R? ($R = xp$) Justify your answer.

$$R = xp$$
$$\downarrow$$
$$R = (1500 - p)\,p = \underset{b}{1500p} \underset{a}{-p^2}$$

$$p = \frac{-b}{2a} = \frac{-1500}{2(-1)} = 750$$

$$R = 1500(750) - (750)^2 = \boxed{\$562,500}$$

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4. $h(t) = -t^2 + 3t + 3$ represents the height of an object, in meters, thrown vertically t seconds after it was thrown.

a) What will be the height of the object at 2 sec?

$$h(2) = -(2)^2 + 3(2) + 3 = \boxed{5 \text{ meters}}$$

b) After how many seconds does the object reach its maximum height?

$$t = \frac{-b}{2a} = \frac{-3}{2(-1)} = \boxed{1.5 \text{ seconds}}$$

c) What is the height of the object when it is at maximum height?

$$h(1.5) = -(1.5)^2 + 3(1.5) + 3 = \boxed{5.25 \text{ meters}}$$