

9 Classwork 9 MAT 1275 Professor Chiu

Name: _____

1. Solve for x :

① Simplify LHS (left hand side) and RHS (right hand side) individually:

$$3(x - 6) + 2(x + 4) = 2x - 12$$

$$\Rightarrow 3x - 18 + 2x + 8 = 2x - 12$$

$$\Rightarrow 5x - 10 = 2x - 12$$

$$\begin{array}{r} -2x \qquad -2x \\ \hline 3x - 10 = 2x - 12 \\ +10 \qquad +10 \\ \hline 3x = -2 \end{array}$$

② Isolate "x" term (do "-2x" on both sides)

$$\Rightarrow 3x - 10 = 2x - 12$$

③ Isolate "non-x" term

$$\Rightarrow 3x = -2$$

④ Divided by "3" on both sides

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

2. Suppose an object has a height $-16t^2 + 78t + 10$ at when the stopwatch reads t seconds. At what time does it hit the ground? At what time is 10 feet above the ground?

Information from Question:

height = $-16t^2 + 78t + 10$ where t is time.

① Hit the ground \Rightarrow height = 0

$$-16t^2 + 78t + 10 = 0$$

$$\Rightarrow -2(8t^2 - 39t - 5) = 0$$

$$\Rightarrow \frac{-2(8t^2 - 39t - 5)}{-2} = \frac{0}{-2}$$

(divided by "-2" on both sides)

$$\Rightarrow 8t^2 - 39t - 5 = 0$$

(factor it)

$$\Rightarrow (t - 5) \cdot (8t + 1) = 0$$

$$\Rightarrow t - 5 = 0 \text{ or } 8t + 1 = 0$$

$$\Rightarrow \begin{array}{r} t - 5 = 0 \\ +5 \quad +5 \\ \hline t = 5 \end{array}$$

$$\Rightarrow \begin{array}{r} 8t + 1 = 0 \\ -1 \quad -1 \\ \hline 8t = -1 \\ \Rightarrow t = -\frac{1}{8} \end{array}$$

$\Rightarrow t = 5$ (since $t = -\frac{1}{8} < 0$ is not an answer)

② What time is 10 feet above ground?

$$\Rightarrow \text{height} = 10$$

$$-16t^2 + 78t + 10 = 10$$

$$\begin{array}{r} -10 \quad -10 \\ \hline \end{array}$$

$$-16t^2 + 78t = 0$$

$$\Rightarrow -2t \cdot (8t - 39) = 0$$

$$\Rightarrow \frac{-2t}{-2} = 0 \quad \text{or} \quad \frac{8t - 39}{+39 \quad +39} = 0$$

$$\Rightarrow t = 0 \quad \text{or} \quad \frac{8t}{8} = \frac{39}{8}$$

$$\Rightarrow \boxed{t = 0 \quad \text{or} \quad t = \frac{39}{8}} \quad \text{both are the answers}$$