

Practice Exam 1 - MC & Short Answers

Wednesday, February 14, 2018

11:19 AM

#1 Plug $N = 176$ to the equation and solve for x :

$$176 = 4x^2 + 5x + 2.$$

$$4x^2 + 5x - 174 = 0$$

$$x = \frac{-5 \pm \sqrt{(5)^2 - 4 \cdot (4) \cdot (-174)}}{8}$$

$$x = \frac{-5 \pm 53}{8} \begin{cases} x = 6 \\ x = -\frac{58}{8} \end{cases}$$

Can't be negative
b/c x is the
of years after
1990.

So, the answer is 1996 ($x = 6$ years after 1990)

② $|8x + 6| + 4 = 7$

$$|8x + 6| = 3$$

$$8x + 6 = 3$$

$$x = -\frac{3}{8}$$

$$\text{or } 8x + 6 = -3$$

$$\text{or } x = -\frac{9}{8}$$

$$\text{Solution set: } \left\{ -\frac{3}{8}, -\frac{9}{8} \right\}$$

③ The relation is NOT a function because the input 3 corresponds to 2 outputs: -9 and 3.

$$④ f(-2) = \sqrt{-2+6} = \sqrt{4} = \boxed{2}$$

$$⑤ h(-6) = -6 - 2 = \boxed{-8}$$

$$⑥ \text{Slope} = \frac{-8 - (-3)}{-4 - (-8)} = \frac{-8+3}{-4+8} = \frac{-5}{4} = -\frac{5}{4}$$

Point-Slope Equation: $y - (-3) = -\frac{5}{4}(x - (-8))$

$$y + 3 = -\frac{5}{4}x - \frac{40}{4}$$

$$y = -\frac{5}{4}x - 10 - 3$$

$$\boxed{y = -\frac{5}{4}x - 13}$$

⑦ Slope of solid line: $-\frac{1}{2}$.

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

$$y = -\frac{1}{2}x + \frac{3}{2} + \frac{8}{2}$$

$$\boxed{y = -\frac{1}{2}x + \frac{11}{2}}$$

Point-Slope Equation: $y - 4 = -\frac{1}{2}(x - 3)$

Slope
intercept

⑧

Average Rate of Change = $\frac{f(x_2) - f(x_1)}{x_2 - x_1}$

$$= \frac{f(6) - f(5)}{6 - 5} = \frac{-3(6)^2 - 6 - (-3(5)^2 - 5)}{1}$$

$$= -3 \cdot 36 - 6 - (-3 \cdot 25 - 5) = \boxed{-34}$$

⑨

$y = |x|$ $\xrightarrow[\text{3 units}]{\text{shifted right}}$ $y = |x - 3|$ $\xrightarrow{\text{stretched by a factor of 3}}$ $y = 3|x - 3|$

$\xleftarrow[\text{across x}]{\text{reflected}}$ $y = 3|x - 3| - 2$ $\xleftarrow[\text{down 2 units}]{} y = 3|x - 3|$

$$\boxed{y = -(3|x - 3| - 2)}$$

⑩ $c(x) = \underbrace{2x}_{\$2 \text{ per mile for } x \text{ miles}} + \underbrace{65}_{\text{flat fee}}$

$$c(15) = 2 \cdot 15 + 65 = \boxed{\$95}$$

⑪ $x^2 + 4x - 45 = 0$

$$(x - 5)(x + 9) = 0$$

$$x = 5 \quad \text{or} \quad x = -9$$

$$\text{Solution set: } \{-9, 5\}$$

⑫ $y = |x| \xrightarrow{8 \text{ units to the right}} y = |x - 8|$