Test 1 Review

Wednesday, September 19, 2018 11:50 AM

$\boxed{\#1}$

$$4x - 3y = 28 \; ; \; (4,4)$$

Plug the point into the equation:

$$4 \cdot 4 - 3 \cdot 4 \overset{?}{=} 28$$

$$4 \neq 28$$

So, (4,4) is NOT a solution of this equation

$\boxed{\#2}$

$$f(2) = 4(2)^2 + 5(2) - 5$$

$$= 16 + 10 - 5$$

$$\boxed{f(2) = 21}$$

$\boxed{\#3}$ To find the domain from graph, we project the graph onto the x-axis. Answer: $\boxed{[-4, 4]}$

#4 $f(x) = \dfrac{7}{2-x}$. Find Domain?

Step 1: Set Denominator $= 0$ and solve for x

$$2 - x = 0 \leftrightarrow x = 2$$

Step 2: Conclusion Domain = set of all real #s except for 2

$$= (-\infty, 2) \cup (2, \infty)$$

$$= \{x \mid x \neq 2\}$$

$\longrightarrow$ choice B.

#5 $(f/g)(3) = \dfrac{f(3)}{g(3)}$

From the graph, $f(3) = 1$ and $g(3) = -1$.

So, $(f/g)(3) = \dfrac{1}{-1} = \boxed{-1}$

#6

$$(f \cdot g)(x) = f(x) \cdot g(x)$$

$$= (5x-6)\cdot(6x-9)$$

$$= 30x^2 - 45x - 36x + 54$$

$$= \boxed{30x^2 - 81x + 54}$$

#7

$$\text{Slope} = \frac{-17-(-13)}{2-7} = \frac{-17+13}{-5} = \frac{-4}{-5} = \boxed{\frac{4}{5}}$$

#8

2 data points $(0, 20000)$; $(5, 10000)$

$$\text{Slope} = \frac{10000 - 20000}{5-0} = \frac{-10000}{5} = \boxed{-2000}$$

22

2nd way to solve this:

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{-10000}{5} = \boxed{-2000}$$

#9

$$\text{Slope} = \frac{8-0}{-9-(-6)} = \frac{8}{-9+6} = \frac{8}{-3} = -\frac{8}{3}.$$

Point-Slope: $y = -\frac{8}{3}(x-(-6))$

$$y = -\frac{8}{3}(x+6)$$

$$y = -\frac{8}{3}x - \frac{48}{3}$$

$$\boxed{y = -\frac{8}{3}x - 16}$$

#10 $-9x - 2y = 39 \rightarrow -2y = 9x + 39 \rightarrow y = -\frac{9}{2}x - \frac{39}{2}$.

Since the line through $(-3,-2)$ is parallel to this, its slope must be $-\frac{9}{2}$.

Point-Slope: $y - (-2) = -\frac{9}{2}(x - (-3))$

Slope-intercept: $y + 2 = -\frac{9}{2}(x+3)$

$$y = -\frac{9}{2}x - \frac{27}{2} - 2$$

$$\boxed{y = -\frac{9}{2}x - \frac{31}{2}}$$

11 $3x - 2y = -1 \rightarrow -2y = -3x - 1 \rightarrow y = \frac{3}{2}x + \frac{1}{2}$

$\rightarrow$ Slope $= \frac{3}{2}$

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

$\rightarrow$ Slope $= -\frac{2}{3}$

→ The 2 lines are perpendicular.

#12 2 data points. x = price ; y = amount of gas sold

x	y
1.35	4820 → (1.35, 4820)
1.40	3961 → (1.40, 3961)

$$\text{Slope} = \frac{3961 - 4820}{1.40 - 1.35} = \frac{-859}{0.05} = -17180$$

Point-Slope Form: $y - 4820 = -17180(x - 1.35)$

Slope-Intercept Form: $\boxed{y = -17180x + 28013}$

Linear Model

At the price $x = \$1.23$, the # of gallons sold:

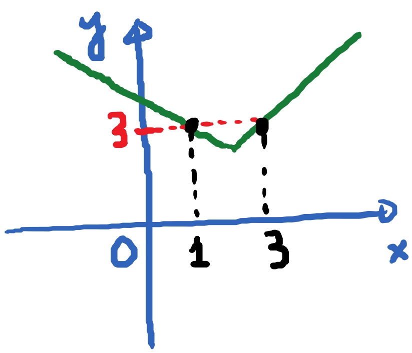
$$y = -17180 \cdot (\$1.23) + 28013$$

$$\boxed{y = 6881.6 \text{ (gallons)}}$$

Short Answer Part

#13 $\underbrace{P(33)}_{\text{pressure at the depth of 33 ft}} = 1 + \frac{33}{33} = \boxed{2 \text{ (atm)}}$

#14 Find x such that $f(x) = 3$ (or $y = 3$)



$\boxed{\text{Answer: } x = 1 \text{ and } x = 3}$

#15

$f(x) = \frac{2}{x-12}$; $g(x) = 7x-5$.

Domain of $\frac{f}{g}$?

Step 1: Domain of f:

$$D_f = (-\infty, 12) \cup (12, \infty)$$

Step 2: Domain of g:

$$D_g = (-\infty, \infty)$$

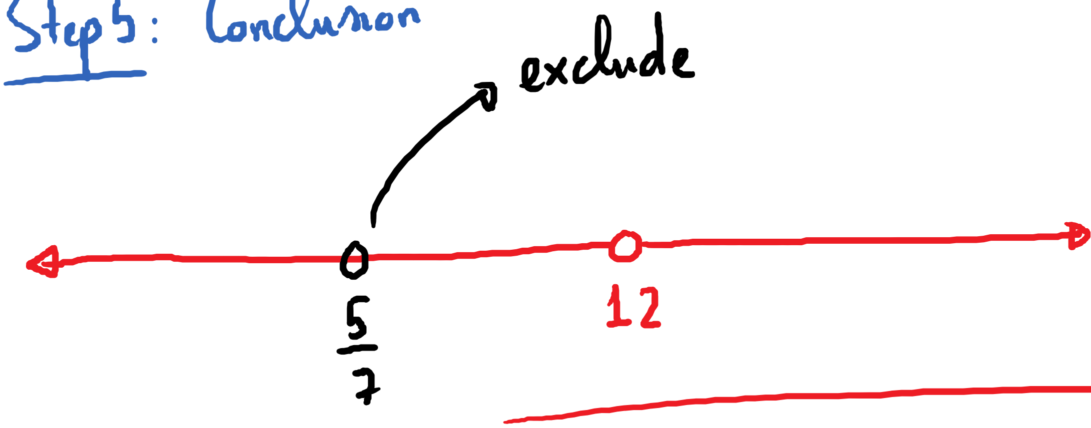
Step 3: Find $D_f \cap D_g$

$$D_f \cap D_g = (-\infty, 12) \cup (12, \infty)$$

Step 4: Find x for which $g(x) = 0$

$$7x - 5 = 0 \leftrightarrow x = \frac{5}{7}$$

Step 5: Conclusion



Domain of $\frac{f}{g}$: $\boxed{\left(-\infty, \frac{5}{7}\right) \cup \left(\frac{5}{7}, 12\right) \cup (12, \infty)}$

In set builder notation: $\boxed{\left\{x \,\middle|\, x \neq \frac{5}{7},\ x \neq 12\right\}}$

$\boxed{\#16}$ $6x - 8y = 8 \longleftrightarrow -8y = -6x + 8$

$\longleftrightarrow y = \frac{3}{4}x - 1 \longrightarrow$ $\boxed{\text{Slope} = \frac{3}{4};\ y\text{-intercept } (0, -1)}$

$\boxed{\#17}$ $\boxed{y = -\frac{8}{5}x + \frac{39}{5}}$

#18 $7x - 8y = -30 \rightarrow -8y = -7x - 30$

$\rightarrow y = \frac{7}{8}x + \frac{15}{4} \rightarrow$ Slope $= \frac{7}{8}$

Since the line through $(6, -9)$ is perpendicular to this, its slope is $-\frac{8}{7}$.

Point-Slope Form: $y - (-9) = -\frac{8}{7}(x - 6)$

Slope-intercept Form: $y + 9 = -\frac{8}{7}x + \frac{48}{7}$

$y = -\frac{8}{7}x + \frac{48}{7} - 9$

$$\boxed{y = -\frac{8}{7}x - \frac{15}{7}}$$

#19

$$f(x) = 6x^2 + 3x.$$

$$f(2a) = 6\cdot(2a)^2 + 3\cdot(2a)$$

$$= 6\cdot(4a^2) + 6a$$

$$\boxed{f(2a) = 24a^2 + 6a}$$

#20

Point - Slope Form:

$$y - (-4) = -\frac{4}{5}(x - 7)$$

Slope - Intercept Form:

$$y + 4 = -\frac{4}{5}x + \frac{28}{5}$$

$$y = -\frac{4}{5}x + \frac{28}{5} - 4$$

$$\boxed{y = -\frac{4}{5}x + \frac{8}{5}}$$