Math

PC40S

Combining Functions

Name:_________________

Multiple Choice

1.) Given $f(x) = x + 4$ and $g(x) = 2\sqrt{x}$, identify the value of $g\big(f(0)\big)$.

a.) 4 b.) $2\sqrt{x+4}$ c.) 2 d.) 0

2.) Identify which function represents $y = f\big(g(x)\big)$, if $f(x) = \sqrt{x+1}$ and $g(x) = x^2 - 2$.

a.) $y = x - 1$ b.) $y = \sqrt{x^2 - 1}$ c.) $y = \sqrt{x^2 - 2}$ d.) $y = \sqrt{x+1} - 2$

3.) Given $f(x) = \frac{1}{x}$ and $g(x) = (x+1)^2$, identify the domain of $h(x) = (f \cdot g)(x)$.

a.) $\{x | x \neq 1, x \in \mathbb{R}\}$ b.) $\{x | x \neq -1, x \in \mathbb{R}\}$ c.) $\{x | x \neq 0, x \in \mathbb{R}\}$ d.) $\{x | x \in \mathbb{R}\}$

4.) Identify the simplified form of $\frac{2^9}{(4^3)^2}$.

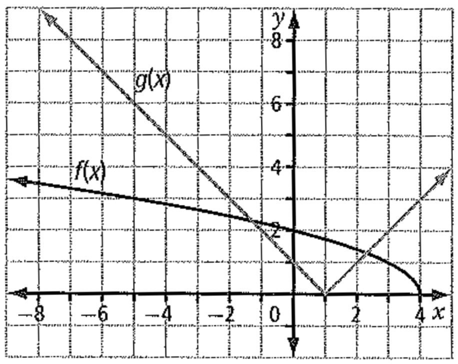
a.) 2^{-3} b.) 2^3 c.) 2^1 d.) 2^{-1}

5.) Identify the quadrant in which $\theta = 2.15$ terminates.

a.) I b.) II c.) III d.) IV

Long Answer

1.) Use the given graph to evaluate the following.



(4)

a.) $(f + g)(4)$

b.) $(f - g)(0)$

c.) $(g - f)(-5)$

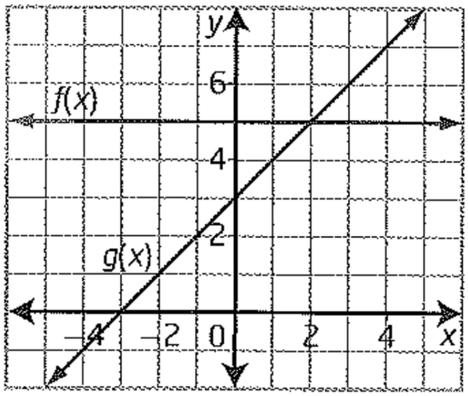
d.) $(f \cdot g)(3)$

e.) Explain why the domain of $(f + g)(x)$ is $(-\infty, 4]$

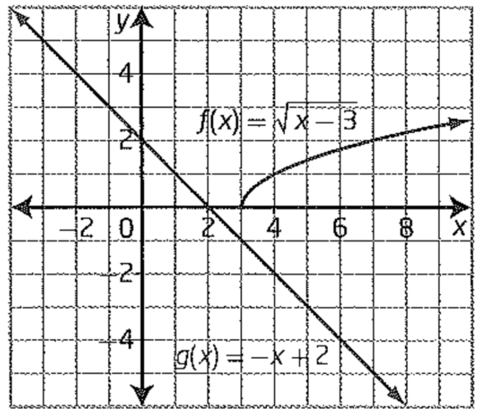
(2)

(4) 2.) Sketch the following

a.) $(f \cdot g)(x)$



b.) $(f - g)(x)$



(3) 3.) Given $f(x) = x + 2$ and $g(x) = x^2 - 4$, determine the equation for $h(x) = \left(\frac{g}{f}\right)(x)$.

State the domain of $h(x)$.

(1) 4.) If $h(x) = f\big(g(x)\big)$, determine $g(x)$ when $h(x) = (2x - 5)^2$ and $f(x) = x^2$.

5.) If $f(x) = 2x + 8$ and $g(x) = 3x - 2$, determine the value of:

(6) a.) $f\left(g(-2)\right)$

b.) $f\left(f(0)\right)$

c.) $g\left(f(a)\right)$

6.) Given $f(x) = \frac{1}{x+4}$ and $g(x) = x^2 + 4x$, determine

(1) a.) $f\left(g(x)\right)$

b.) the domain of $f\left(g(x)\right)$.

(2)

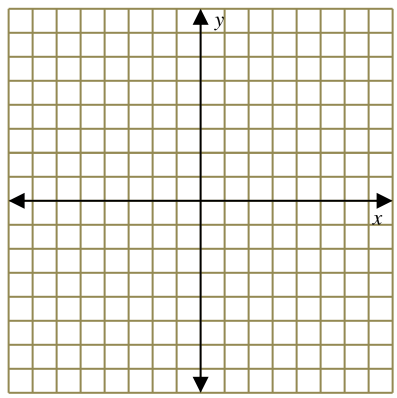
7.) Given $f(x) = x + 1$ and $g(x) = x^2$,

a.) determine $f\big(g(x)\big)$

(1)

a.) sketch the graph of $f\big(g(x)\big)$

(2)



8.) Determine the exact value of $\sin\frac{19\pi}{12}$.

(3)

9.) Solve.

$$\log_3(2x-1) = 2 - \log_3(x+1)$$

(4)

10.) The domain of a function is $(-\infty, 5]$. Chris says this means that the range of its inverse function must be $(-\infty, 5]$. His teacher says he is correct. Explain why the domain of any function becomes the range its inverse.

(2)