

**Multiple Choice**

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

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

2.) Identify which function represents  $y = f(g(x))$ , 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  $\frac{2^9}{(4^3)^2}$ .

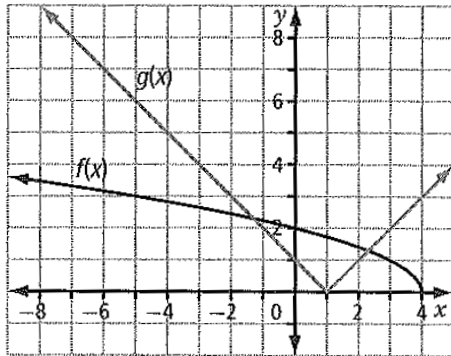
- a.)  $2^{-3}$                       b.)  $2^3$                       c.)  $2^1$                       d.)  $2^{-1}$

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

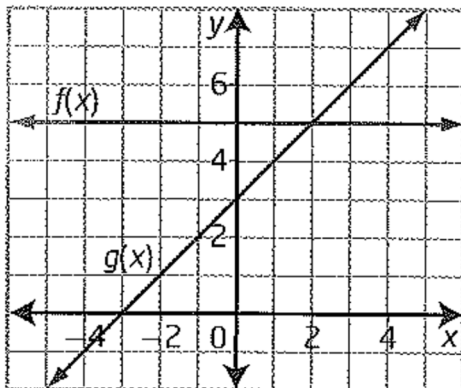
e.) Explain why the domain of  $(f + g)(x)$  is  $(-\infty, 4]$

(2)

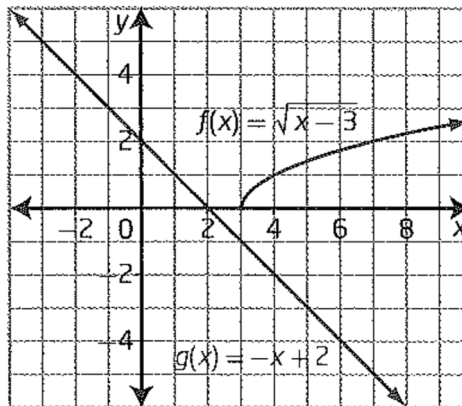
2.) Sketch the following

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

(4)



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



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  $h(x)$ .

(3)

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

(1)

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

a.)  $f(g(-2))$

b.)  $f(f(0))$

c.)  $g(f(a))$

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

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

(2) b.) the domain of  $f(g(x))$ .

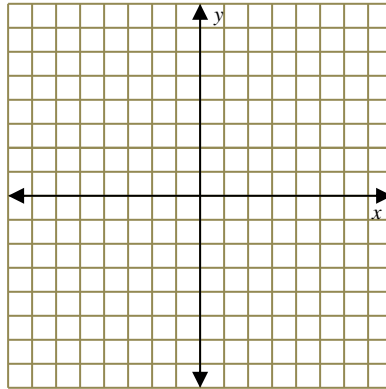
7.) Given  $f(x) = x + 1$  and  $g(x) = x^2$ ,

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

(1)

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

(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)