

Name \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.****Solve the problem.**

- 1) Ken is 6 feet tall and is walking away from a streetlight. The streetlight has its light bulb 14 feet above the ground, and Ken is walking at the rate of 1.4 feet per second. Find a function,  $d(t)$ , which gives the distance Ken is from the streetlight in terms of time. Find a function,  $S(d)$ , which gives the length of Ken's shadow in terms of  $d$ . Then find  $(S \circ d)(t)$ .

A)  $(S \circ d)(t) = 0.77t$       B)  $(S \circ d)(t) = 1.33t$       C)  $(S \circ d)(t) = 1.05t$       D)  $(S \circ d)(t) = 2.37t$

- 2) The function  $f(x) = 60x$  computes the number of minutes in  $x$  hours. The function  $g(x) = 24x$  computes the number of hours in  $x$  days. What is  $(f \circ g)(x)$  and what does it compute?

- A)  $(f \circ g)(x) = 84x$ ; It computes the number of minutes plus the number of days in  $x$  days.  
 B)  $(f \circ g)(x) = 1440x$ ; It computes the number of days in  $x$  minutes.  
 C)  $(f \circ g)(x) = 1440x^2$ ; It computes the number of minutes in  $x$  days.  
 D)  $(f \circ g)(x) = 1440x$ ; It computes the number of minutes in  $x$  days.

**For the pair of functions, perform the indicated operation.**

3)  $f(x) = \frac{8x-5}{4}$ ,  $g(x) = \frac{1}{x}$

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

A)  $\frac{8x^2 - 5x + 4}{4x}$       B)  $\frac{8x^2 - 5x - 4}{4x}$       C)  $\frac{8x^2 - 5x - 1}{4x}$       D)  $\frac{8x - 5}{4 - x}$

**Find the requested composition of functions.**

- 4) Given  $f(x) = \sqrt{x+8}$  and  $g(x) = 8x - 12$ , find  $(f \circ g)(x)$ .

A)  $2\sqrt{2x+1}$       B)  $8\sqrt{x-4}$       C)  $8\sqrt{x+8} - 12$       D)  $2\sqrt{2x-1}$

**Find the requested function value.**

- 5) Find  $(g \circ f)(-4)$  when  $f(x) = 4x + 5$  and  $g(x) = 4x^2 - 5x - 3$ .

A) 9      B) 536      C) 329      D) 8

**Find the requested composition of functions.**

- 6) Given  $f(x) = \frac{5}{x-7}$  and  $g(x) = \frac{3}{4x}$ , find  $(f \circ g)(x)$ .

A)  $\frac{5x}{3-28x}$       B)  $\frac{3x-21}{20x}$       C)  $\frac{20x}{3-28x}$       D)  $\frac{20x}{3+28x}$

**Evaluate.**

- 7) Use  $f(x) = x - 3$  and  $g(x) = x + 3$  to evaluate  $(f \cdot g)(2)$ .

A) -7      B) 1      C) 4      D) -5



Find the inverse of the function.

$$13) f(x) = \frac{2}{x+7}$$

$$A) f^{-1}(x) = \frac{7+2x}{x}$$

$$B) f^{-1}(x) = \frac{x}{7+2x}$$

C) Not a one-to-one function

$$D) f^{-1}(x) = \frac{-7x+2}{x}$$

Determine whether or not the function is one-to-one.

$$14) f(x) = \frac{5}{x+7}$$

A) Yes

B) No

Solve the problem.

15) The supply function for a product is  $p(x) = \frac{1}{3}x^2 + 30$ , where  $x$  is the number of thousands of units a

manufacturer will supply if the price is  $p(x)$  dollars. Find the inverse of this function.

$$A) p^{-1}(x) = 3\sqrt{x} - 30$$

$$B) p^{-1}(x) = 3\sqrt{x-30}$$

$$C) p^{-1}(x) = \frac{1}{3}\sqrt{x} + 30$$

$$D) p^{-1}(x) = \sqrt{3(x-30)}$$

Determine whether  $(f \circ g)(x) = x$  and whether  $(g \circ f)(x) = x$ .

$$16) f(x) = \sqrt{x+1}, g(x) = x^2$$

A) Yes, yes

B) Yes, no

C) No, no

D) No, yes

Solve the problem.

17) The surface area of a sphere is  $f(x) = 4\pi x^2$  square inches, where  $x$  is the radius of the sphere in inches. Find the inverse of this function.

$$A) f^{-1}(x) = 2\sqrt{\pi x}$$

$$B) f^{-1}(x) = \frac{1}{2}\sqrt{\frac{x}{\pi}}$$

$$C) f^{-1}(x) = 2\sqrt{\frac{\pi}{x}}$$

$$D) f^{-1}(x) = \frac{\sqrt{x}}{2\pi}$$

If the following defines a one-to-one function, find its inverse. If not, write "Not one-to-one."

18) 

x	f(x)
2	22
8	-4
13	-12
17	16

x	f <sup>-1</sup> (x)

A) 

x	f <sup>-1</sup> (x)
22	2
-4	8
-12	13
16	17

B) Not one-to-one

C) 

x	f <sup>-1</sup> (x)
22	2
-4	8
-12	17
16	13

D) 

x	f(x)
2	16
8	22
13	-4
17	-12

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

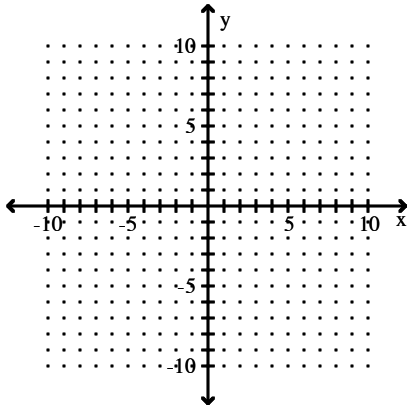
Provide an appropriate response.

19) True or false? If  $f$  is a one-to-one function and the graph of  $f$  lies completely within the first quadrant, then the graph of  $f^{-1}$  lies completely within the third quadrant.

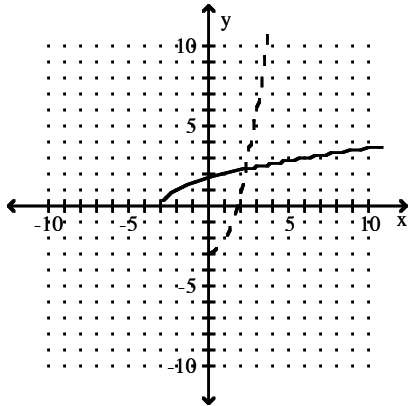
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Graph the given function as a solid line (or curve) and its inverse as a dashed line (or curve) on the same set of axes.

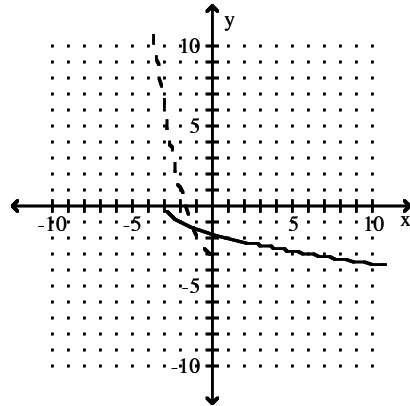
20)  $f(x) = -\sqrt{x+3}$



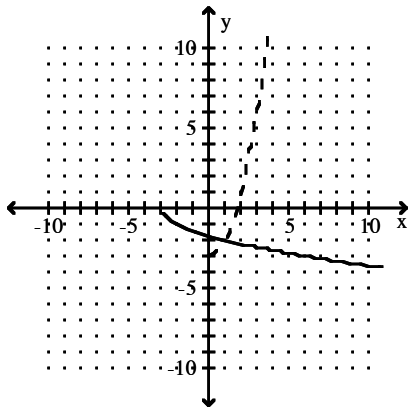
A)



B)



C)



D)

