

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)  $(S \circ d)(t) = 2.37t$

Answer: C

Objective: (2.6) Solve Apps: Composition of Functions

- 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.

Answer: D

Objective: (2.6) Solve Apps: Composition of Functions

**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)  $\frac{8x - 5}{4 - x}$

Answer: B

Objective: (2.6) Find Sum/Difference/Product/Quotient of Functions

**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)  $2\sqrt{2x-1}$

Answer: D

Objective: (2.6) Find Composition of Functions

**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

Answer: B

Objective: (2.6) Evaluate Composition of Functions

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)  $\frac{20x}{3+28x}$

Answer: C

Objective: (2.6) Find Composition of Functions

Evaluate.

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

A) -7

B) 1

C) 4

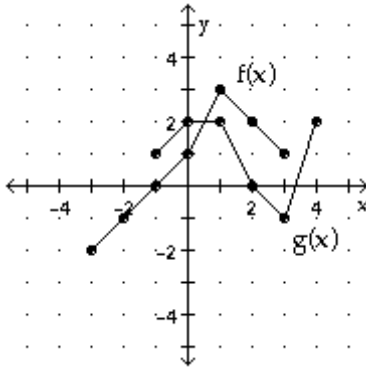
D) -5

Answer: D

Objective: (2.6) Evaluate Sum/Diff/Product/Quotient of Functions

For the functions  $f$  and  $g$ , find the requested value.

8) Evaluate  $(f+g)(3)$ .



A) -1

B) 1

C) 0

D) 3

Answer: C

Objective: (2.6) Evaluate Operation/Composition Given Graphs

Find the requested composition of functions.

9) Given  $f(x) = |18 - x|$  and  $g(x) = 3x + 2$ , find  $(g \circ f)(x)$ .

A)  $|16 - 3x|$

B)  $3|18 - x| + 2$

C)  $3 + 2|18 - x|$

D)  $|16 + 3x|$

Answer: B

Objective: (2.6) Find Composition of Functions

Evaluate.

10) Use  $f(x) = 2x + 10$  and  $g(x) = x^2 + 3$  to evaluate  $(g/f)(2)$ .

A)  $\frac{1}{2}$

B) 21

C) 98

D) 2

Answer: A

Objective: (2.6) Evaluate Sum/Diff/Product/Quotient of Functions

Find the requested composition of functions.

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

A)  $\frac{1715}{x^3}$

B)  $\frac{5x^3}{343}$

C)  $\frac{5x^3}{7}$

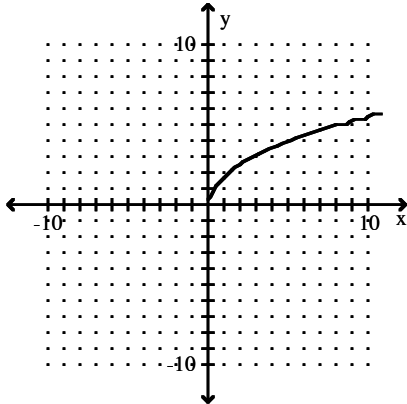
D)  $\frac{7}{5x^3}$

Answer: A

Objective: (2.6) Find Composition of Functions

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

12)



A) No

B) Yes

Answer: B

Objective: (2.7) Determine if Function Is One-to-One from Table/Graph (Y/N)

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

Answer: D

Objective: (2.7) Find Equation of Inverse Function

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

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

A) Yes

B) No

Answer: A

Objective: (2.7) Determine if Function Is One-to-One from Equation (Y/N)

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

Answer: D

Objective: (2.7) Solve Apps: Inverse Functions II

**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

Answer: C

Objective: (2.7) Determine Whether Either or Both Composites Yield  $x$

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

Answer: B

Objective: (2.7) Solve Apps: Inverse Functions I

**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

Answer: A

Objective: (2.7) Find Inverse of Function Defined by Table

**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.

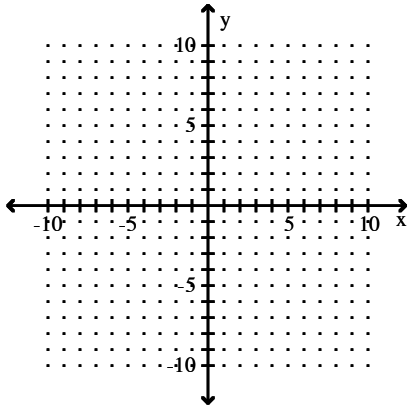
Answer: True  False

Objective: (2.7) \*Know Concepts: Inverse Functions

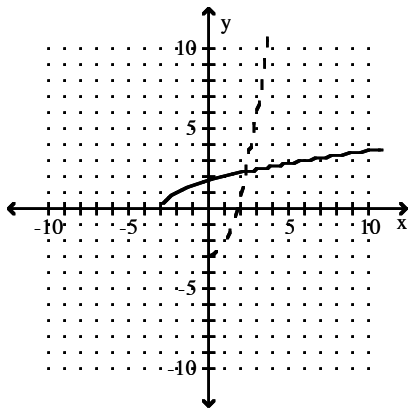
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

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.

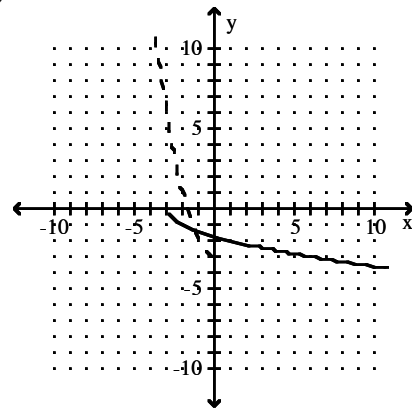
20)  $f(x) = -\sqrt{x+3}$



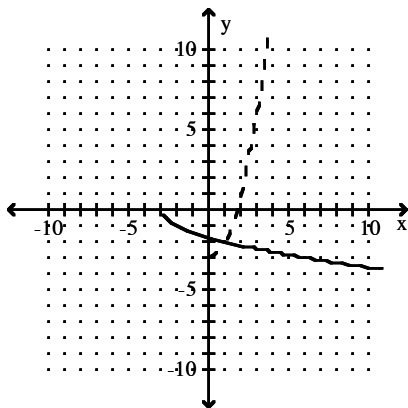
A)



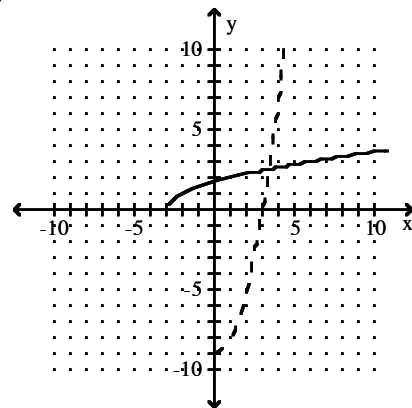
B)



C)



D)



Answer: B

Objective: (2.7) Graph Function and its Inverse