

Test #1

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Find the domain of the function.

$$g(u) = \sqrt{u} - \sqrt{9-u}$$

Select the correct answer.

- a. $u \in [0, +\infty)$
- b. $u \in (-\infty, 0]$
- c. $u \in (0, 9)$
- d. $u \in [0, 9]$
- e. $u \in (-\infty, 9]$

2. Find the range of the function.

$$g(x) = \sin^{-1}(5x+1)$$

Select the correct answer.

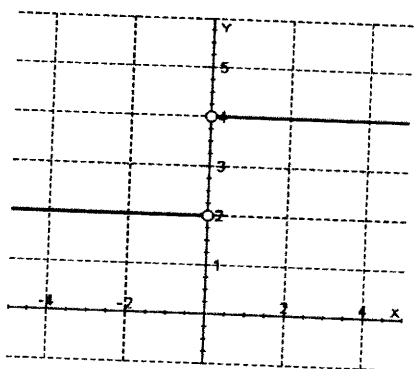
- a. $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
- b. $[0, \pi]$
- c. $[-\pi, \pi]$
- d. $\left[0, \frac{\pi}{2}\right]$
- e. $[0, 2\pi]$

3. Suppose that the graph of $y = \log_2 x$ is drawn on a coordinate grid where the unit of measurement is an inch. How many miles to the right of the origin do we have to move before the height of the curve reaches 2 ft?

Select the correct answer.

- a. 265 mi
- b. 269 mi
- c. 259 mi
- d. 261 mi
- e. 271 mi

4. Which function is represented by the following graph?



Select the correct answer.

a. $G(x) = \frac{3x - |-x|}{x}$

b. $G(x) = \frac{3x + |x|}{x}$

c. $G(x) = \frac{3x - |x|}{x}$

d. $G(x) = \frac{3x + |-x|}{x}$

e. $G(x) = \frac{3 + |x|}{x}$

5. Which of the following graphs is neither even nor odd?

Select the correct answer.

a. $f(x) = 6x^3 + 8x^2 + 7$

b. $f(x) = x^4 - 4x^2$

c. $f(x) = x^3 - 5x$

6. Suppose that the graph of f is given. Describe how the graph of the function $y = f(x - 3) - 3$ can be obtained from the graph of f .

Select the correct answer.

a. Shift the graph 3 units to the right and 3 units down.

b. Shift the graph 3 units to the left and 3 units down.

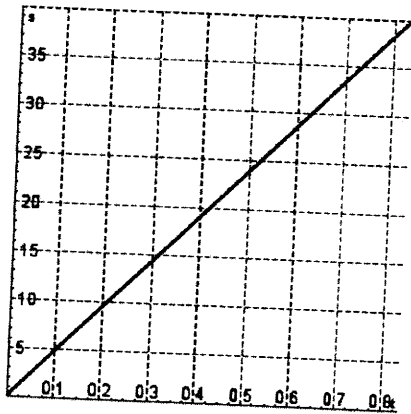
c. Shift the graph 3 units to the right and 3 units up.

d. Shift the graph 3 units to the left and 3 units up.

e. none of these

7. Jason leaves Detroit at 6:00 P.M. and drives at a constant speed west along I-90. He passes Ann Arbor, 40 mi from Detroit, at 6:50 P.M.

Find the slope of the function.



Select the correct answer.

- a. 48
- b. 36
- c. 64
- d. 24
- e. 14

8. Find the range of the function.

$$h(x) = \ln(x + 6)$$

Select the correct answer.

- a. $(-6, \infty)$
- b. $[-6, \infty)$
- c. $(-\infty, \infty)$
- d. $(-6, 6)$
- e. $(0, \infty)$

9. If $f(x) = x^2 - 2x + 3$, evaluate the difference quotient $\frac{f(a+h) - f(a)}{h}$

Select the correct answer.

- a. h
- b. $2a - 2$
- c. $2a - h - 2$
- d. $2a + h - 2$
- e. none of these

10. Find the domain of f^{-1} .

$$f(x) = \sqrt{6 - e^{6x}}$$

Select the correct answer.

- a. $[0, \sqrt{6})$
- b. $[0, \sqrt{6}]$

- c. $(0, \sqrt{6})$
- d. $(0, \infty)$
- e. $(-\infty, \sqrt{6})$

11. Find an expression for the function $y = f(x)$ whose graph is the bottom half of the parabola $x + (8 - y)^2 = 0$.

Select the correct answer.

- a. $y = 8 + \sqrt{x}$
- b. $y = 64 - \sqrt{-x}$
- c. $y = 8 - \sqrt{-x}$
- d. $y = 8 - x^2$
- e. $y = 64 - x^2$

12. What is $\sqrt[6]{x}$, given that $H = f \circ g \circ h$ and $H(x) = \sqrt[6]{\sqrt{x} - 4}$?

Select the correct answer.

- a. $g(x)$
- b. $h(x)$
- c. $f(x)$

13. Use a graphing calculator or computer to determine which viewing rectangle produces the most appropriate graph of the function.

$$f(x) = \sqrt{4x - x^2}$$

Select the correct answer.

- a. $[-5, 5]$ by $[0, 100]$
- b. $[-2, 2]$ by $[-2, 2]$
- c. $[-4, 4]$ by $[-4, 4]$
- d. $[-1, 5]$ by $[-1, 4]$
- e. $[1, 5]$ by $[1, 4]$

14. Use the table to evaluate the expression $(f \circ g)(3)$.

x	1	2	3	4	5	6
$f(x)$	3	2	1	0	1	2
$g(x)$	6	5	2	3	4	6

Select the correct answer.

- a. 2
- b. 3
- c. 1
- d. 5
- e. 6

15. Starting with the graph of $y = e^x$, find the equation of the graph that results from reflecting about the line $y = 5$.

Select the correct answer.

- a. $y = -e^x$
- b. $y = -e^{x+10}$
- c. $y = -e^x + 10$
- d. $y = e^{-x} + 10$
- e. $y = -e^{-5x} + 10$

16. Solve each equation for x .

- a) $\ln x = 2$
- b) $e^{e^x} = 3$

Select the correct answer.

- a. $x = e^2, x = \ln(\ln 3)$
- b. $x = e^2, x = \ln(\ln 2)$
- c. $x = \frac{e^{\ln 2}}{2}, x = \ln(\ln 2)$
- d. $x = e^{\ln 2}, x = e \ln 3$
- e. $x = 2 \ln 2, x = \ln 3$

17. Suppose the graphs of $f(x) = x^2$ and $g(x) = 2^x$ are drawn on a coordinate grid where the unit of measurement is 1 inch. At a distance 1 ft to the right of the origin, the height of the graph of f is 12 ft. Find the height of the graph of g .

Select the correct answer.

- a. 331 ft
- b. 341 ft
- c. 171 ft
- d. 3,410 ft
- e. 3,110 ft

18. If $f(x) = 3x + \ln x$, find $f^{-1}(3)$.

Select the correct answer.

- a. $f^{-1}(3) = 1$
- b. $f^{-1}(3) = 2$
- c. $f^{-1}(3) = -1$
- d. $f^{-1}(3) = 0$
- e. $f^{-1}(3) = 3$

19. If a bacteria population starts with 100 bacteria and doubles every three hours, then the number of bacteria after t hours is $N = f(t) = 100(2^{t/3})$. When will the population reach 50,000?

Select the correct answer.

- a. 100 hours
- b. 26.9 hours
- c. 20.9 hours
- d. 10.9 hours
- e. 22.5 hours

20. Find the inverse function of $f(x) = \frac{x+1}{2x+1}$.

Select the correct answer.

- a. $f^{-1}(x) = -(x+1)(2x+1)$
- b. $f^{-1}(x) = (x+1)(2x+1)$
- c. $f^{-1}(x) = -\frac{2x-1}{x-1}$
- d. $f^{-1}(x) = -\frac{x-1}{2x-1}$
- e. $f^{-1}(x) = \frac{x}{2x-1}$

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