

**Honors Math 3 Chapter 2/Functions Practice Test-Show work where appropriate.**

**Short Answer**

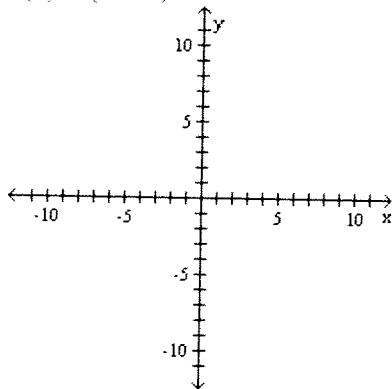
1. Write an equation that results in the indicated translation: The square root function, shifted 5 units upward.

2. Write an equation that results in the indicated translation: The square root function, reflected across the y-axis.

3. Write an equation that results in the indicated translation: The absolute value function, shifted 5 units to the left.

4. Graph the function by starting with the graph of the basic function and then using the techniques of shifting, compressing, stretching, and/or reflecting.

$$f(x) = (x + 6)^3 + 1$$



5. A deep sea diving bell is being lowered at a constant rate. After 9 minutes, the bell is at a depth of 500 ft. After 55 minutes the bell is at a depth of 1800 ft. What is the average rate of lowering per minute? Round to the nearest hundredth is needed.

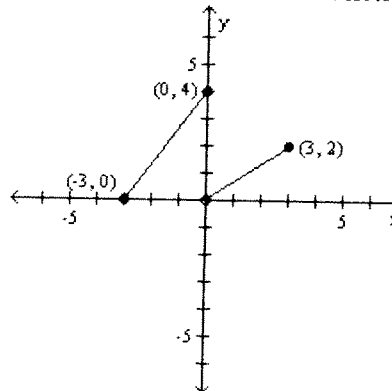
6. Each month a gas station sells  $x$  gallons of gas at \$1.92/gallon. The cost to the owner of the gas station for each gallon of gas is \$1.32. The monthly fixed cost for running the gas station is \$37,000. Write an equation that relates the monthly profit, in dollars, to the number of gallons of gasoline sold. Then use the equation to find the monthly profit when 75,000 gallons of gas are sold in a month.

7. Find an equation of the secant line containing  $(1, f(1))$  and  $(2, f(2))$ .

$$f(x) = \frac{4}{x + 3}$$

8. John owns a hotdog stand. He has found that his profit is represented by the equation  $P(x) = -x^2 + 64x + 73$  with  $P$  being profits and  $x$  the number of hotdogs sold. How many hotdogs must he sell to earn the most profit?

9. The graph of a piecewise-defined function is given. Write a definition for the function.



10. Use a graphing utility to graph the function over the indicated interval to answer the following. If necessary, round answers to two decimal places.

$$f(x) = -0.3x^3 + 0.2x^2 + 4x - 5; \quad (-4, 5)$$

$x$ -value(s) where any local maxima occur: \_\_\_\_\_

Local maxima: \_\_\_\_\_

$x$ -value(s) where any local minima occur: \_\_\_\_\_

Local minima: \_\_\_\_\_

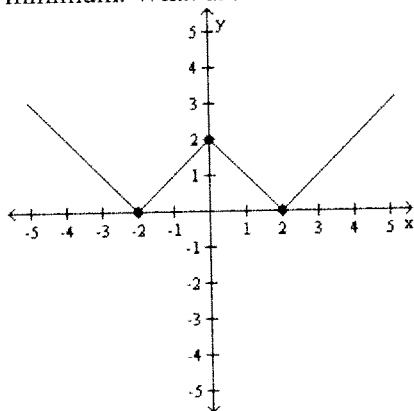
Intervals where  $f$  is...

Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

11. The graph of a function  $f$  is given. Use the graph to answer the question.

Find the numbers, if any, at which  $f$  has a local minimum. What are the local minima?



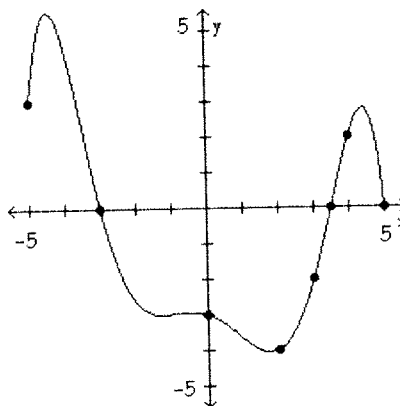
12. Determine **algebraically** whether the function  $f(x) = 5x^3 - 9$  is even, odd, or neither.

13. Determine **algebraically** whether the function  $h(x) = \frac{3x + 4}{x - 2}$  is even, odd, or neither.

14. Find the domain of the function, give the answer as a restriction:  $h(x) = \frac{x - 4}{x^3 - 16x}$

15. Find the domain of the function, give the answer in interval notation:  $f(x) = \frac{x}{\sqrt{x - 5}}$

16. The graph of a function  $f$  is given. Use the graph to answer the question. Use interval notation. For what numbers  $x$  is  $f(x) < 0$ ?



17. Find the values for the function  $f(x) = -2x^2 - 5x + 5$ . Simplify when appropriate.

Find  $f(3)$ :

Find  $f(x + h)$ :

18. Evaluate.

If  $f(x) = \text{int}(4x)$ , find  $f(2.2)$ .

19. Use a graphing calculator to plot the data and find the equation of best fit.

A small manufacturing firm collected the following data on advertising expenditures (in thousands of dollars) and total revenue (in thousands of dollars). Round to two decimals.

| Advertising, $x$ | Total Revenue, $R$ |
|------------------|--------------------|
| 25               | 6430               |
| 28               | 6432               |
| 31               | 6434               |
| 32               | 6434               |
| 34               | 6434               |
| 39               | 6431               |
| 40               | 6432               |
| 45               | 6420               |

20. Use a graphing utility to find the equation of best fit. Round to two decimal places, if necessary.

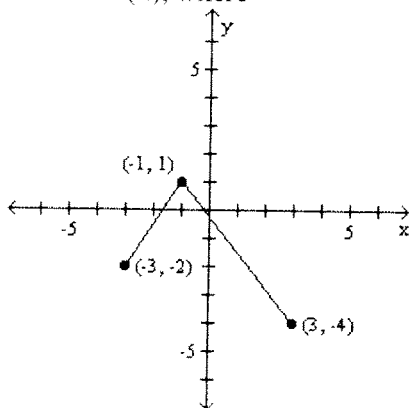
Managers rate employees according to job performance and attitude. The results for several randomly selected employees are given below.

Performance

Attitude

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 59 | 63 | 65 | 69 | 58 | 77 | 76 | 69 | 70 | 64 |
| 72 | 67 | 78 | 82 | 75 | 87 | 92 | 83 | 87 | 78 |

21. The graph of a function  $f$  is illustrated. Use the graph of  $f$  as the first step toward graphing the function  $F(x)$ , where  $F(x) = f(x + 2) - 1$ .



22. **Find the function** that is finally graphed after the following transformations are applied to the graph of  $y = |x|$ . The graph is shifted right 3 units, stretched by a factor of 3, shifted vertically down 2 units, and finally reflected across the x-axis.

