

Non-Calculator

1. What transformation maps the graph of $y = 7.5^x$ onto the graph of $y = 7.5^{x+3} - 1.5$? 1. _____

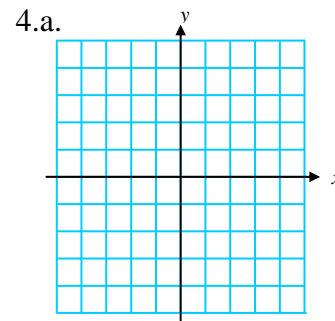
2. Suppose the point $(-6, 5)$ lies on the graph of the function h . Find a point that lies on the image of h under the translation $T(x, y) \rightarrow (x + 3, y - 4)$. 2. _____

3. Consider the function g with $g(x) = x^3$.
a. Find an equation for the image of the graph of g under the transformation $T: (x, y) \rightarrow (x - 7, y - 1)$. 3. a. _____

b. Describe in words the effect T has on the graph of g . b. _____

4. Let $f(x) = \frac{1}{x+2} - 1$.

a. Sketch a graph of $y = f(x)$.



b. Identify the parent function and state the transformation rule that maps the graph of the parent function onto the graph of $y = f(x)$. b. _____

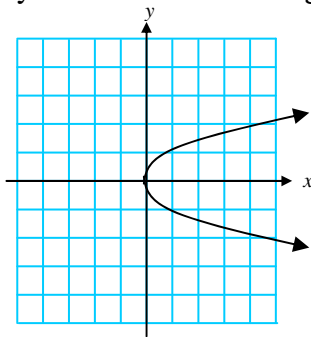
5. Given $S(x) = 5x^2 - x^4$. Determine whether the function is even, odd or neither. Prove your answer. 5. proof at left

6. Consider the function f with $f(x) = \frac{|x^3 + 2x|}{x}$. Prove that f is an odd function.

6. proof at left

7. Classify whether the relation graphed below appears to be odd, even or neither.

7. _____



8. What transformation gives the graph of $y = 2\left|\frac{1}{3}x\right|$ from the graph of its parent function.

8. _____

9. Consider the function f with $f(x) = x^2$. Find an equation for the image of the graph of f under the transformation $S(x, y) \rightarrow (-2x, 3y)$.

9. _____

10. Multiple choice: Which scale change has the effect on a graph of stretching horizontally by a factor of 5 and stretching vertically by a factor of 6?

10. _____

A) $S(x, y) \rightarrow (5x, \frac{1}{6}y)$

B) $S(x, y) \rightarrow (\frac{1}{5}x, \frac{1}{6}y)$

C) $S(x, y) \rightarrow (5x, 6y)$

D) $S(x, y) \rightarrow (\frac{1}{5}x, 6y)$

11. Multiple choice: The x-intercepts of the graph of $f(x) = x^2 + 7x + 10$ are -2 and -5 . What are the x-intercepts of the image of f under the transformation $S(x, y) \rightarrow (3x, 2y)$?

11. _____

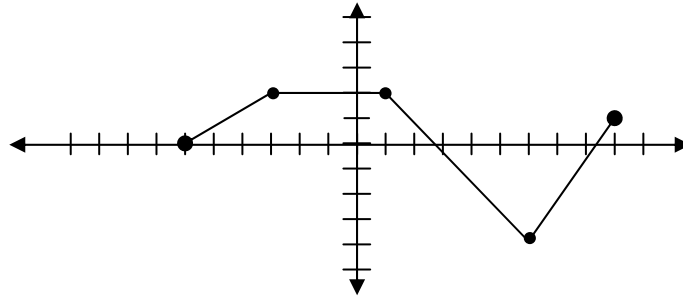
A) -0.66 and 2.5

B) -6 and -15

C) -5 and -10

D) 1 and -3

12. The graph of $y = f(x)$ is drawn below. Draw the graph of $y = -2f(3x)$.



12. answer on graph

13. Let $f(x) = \frac{1}{x-4}$ and let $g(x) = x+4$.

- Evaluate $(f \circ g)(4)$.
- Evaluate $(g \circ f)(4)$.
- Find a formula for $f \circ g$.
- Give the domain of $f \circ g$.

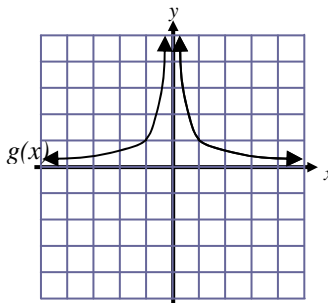
- _____
- _____
- _____
- _____

14 Multiple choice. Let $f(x) = \sqrt{x^2 + 2x + 1}$ and let $g(x) = x^2 - 1$. Find $g(f(2))$.

- A) 8 B) 4 C) 16 D) 24

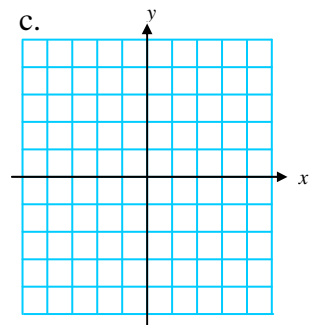
14. _____

15. Refer to the graph of function g .



- Name the parent function studied in this chapter whose graph most closely resembles the graph of g .
- Describe the symmetry of the graph of g .
- Graph the inverse of g .

- _____
- _____



d. Is the inverse of g a function? Justify your answer.

d. _____

16. Multiple choice. Let h be a function with $h(x) = 4x + 4$. Which is an equation of h^{-1} , the inverse of h ? 16. _____

A) $h^{-1}(x) = \frac{1}{4} + x$

B) $h^{-1}(x) = \frac{x}{4} - 1$

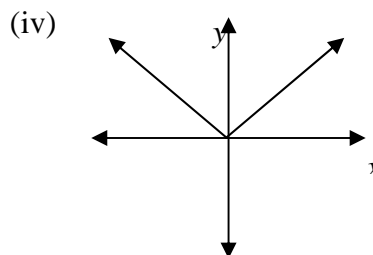
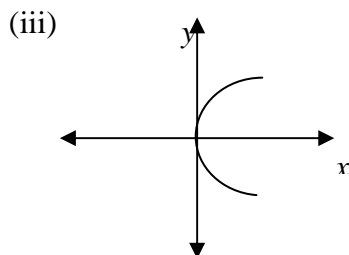
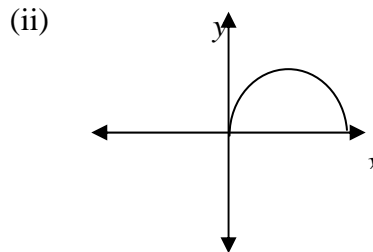
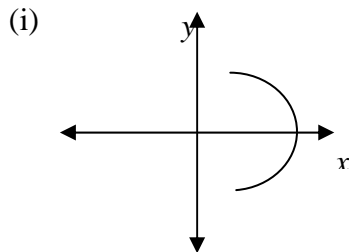
C) $h^{-1}(x) = \frac{4}{x+1} - 5$

D) $h^{-1}(x) = \frac{1}{x} + 4$

17. a. Describe the inverse of function $\{(0,0), (1,-1), (2,-2), (3,3)\}$. 17.a. _____
 b. State whether the inverse is also a function. b. _____

18. Consider the function f defined on the set of real numbers with $f(x) = \sqrt{2x-3}$. 18.a. _____
 a. Find an equation for f^{-1} . b. _____
 b. What are the domain and range of f^{-1} ? _____

19. Choose from the graphs below. Identify the graphs that represent relations whose inverses are functions. 19. _____



20. True or false. If (a,b) is a point on the graph of a relation, then $(-b,-a)$ must be a point on the graph of its inverse. 20. _____

Previous Chapter Review

21. Write a linear function whose graph passes through the points $(-4,3)$ and $(2, 1)$. 21. _____

22. Write an exponential function whose graph passes through the points $(3, 1)$ and $(8, 32)$. 22. _____

23. Given the quadratic function $f(x) = x^2 + 8x - 33$,

a. Find the y-intercept.

b. Find the x-intercepts

c. Find the vertex.

23.a. _____

b. _____

c. _____

Answer Key

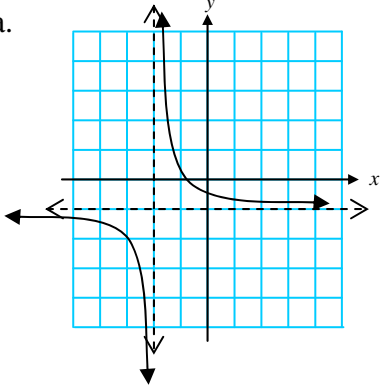
1. $T(x, y) \rightarrow (x-3, y-1.5)$

2. $(-3, 1)$

3.a. $y = (x+7)^3 - 1$

b. translates left 7, down 1

4.a.



b. $p(x) = \frac{1}{x}$; inverse linear; translates left 2,

down 1; $T(x, y) \rightarrow (x-2, y-1)$

5. $S(-x) = 5(-x)^2 - (-x)^4$

$$S(-x) = 5x^2 - x^4$$

$$S(-x) = S(x)$$

Therefore, the function is even.

6. $f(-x) = \frac{|(-x)^3 + 2(-x)|}{(-x)}$

$$f(-x) = \frac{|-x^3 - 2x|}{-x}$$

$$f(-x) = \frac{|x^3 + 2x|}{-x}$$

$$f(-x) = -\frac{|x^3 + 2x|}{x}$$

$$f(-x) = -f(x)$$

Therefore, the function is odd.

7. neither

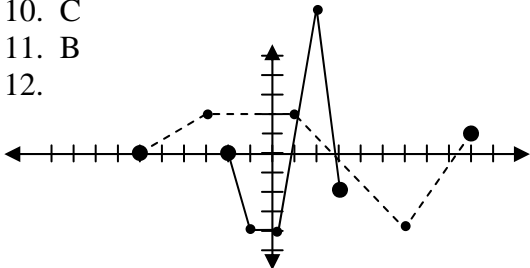
8. $S(x, y) \rightarrow (3x, 2y)$

9. $y = 3\left(-\frac{x}{2}\right)^2$

10. C

11. B

12.



13.a. $\frac{1}{4}$

b. undefined

c. $f \circ g = \frac{1}{x}$

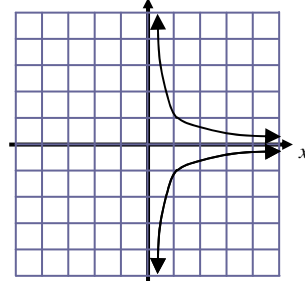
d. $D: x \neq 0$

14. A

15.a. $p(x) = \frac{1}{x^2}$

b. reflection over the y axis

c.



d. no, the original function does not pass the horizontal line test.

16. B

17.a. $\{(0, 0), (-1, 1), (-2, 2), (3, 3)\}$

b. yes

18.a. $f^{-1}(x) = \frac{x^2}{2} + \frac{3}{2}$

b. $D: x \in \mathcal{R}$ $R: y \geq \frac{3}{2}$

19. i, iii

20. false

21. $y = -\frac{1}{3}x + 1\frac{2}{3}$

22. $y = \frac{1}{8}(2)^x$

23.a. -33

b. -11 and 3

c. $(-4, -49)$