Name: _____

3.3 – Vertical Stretches & Compressions

Past due on: _____ Period: _____

1. Let $y = f(x)$. Write a formula for the transformation that both increases the y-value by a factor of 10 and shifts the graph to the right by 2 units.

2. The points $(-12, 20)$ & $(0, 6)$ lie on the graph of f. The graph of h is found by shifting the graph of f to the left 3 units, stretching it vertically by a factor of 2, then shifting it up 6 units.
   a. Find a formula for h in terms of f.

   b. Determine the coordinates of the corresponding two points on the graph of h.

3. Suppose $(-3, 5)$ is a point on the graph of $y = g(x)$.
   What point is on the graph of $y = -3g(x - 4) + 3$?

4. The function $h(x)$ has domain $[-3, 6]$ and range $[-5, 4]$.
   What is the domain and the range of $y = 3h(x + 4) - 1$?

Match the function with its graph. Use your knowledge of graphing transformations and not a calculator. The parent function, $y = |x|$, is shown first.

5. $g(x) = -2|x|$

6. $g(x) = |x - 1| + 1$

7. $g(x) = -\dfrac{1}{3}|x|$

8. $g(x) = 2|x|$

9. $g(x) = |x + 2|$

10. $g(x) = |x| + 3$

11. $g(x) = -\dfrac{1}{2}|x - 4|$

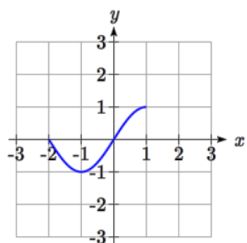12. $g(x) = \dfrac{1}{2}|x| - 3$

13. $g(x) = -|x| - 2$
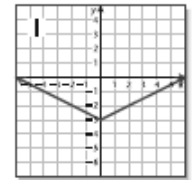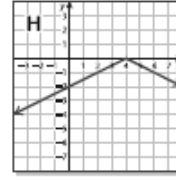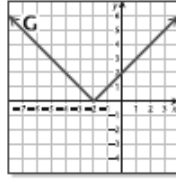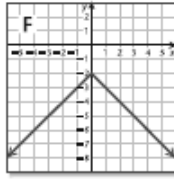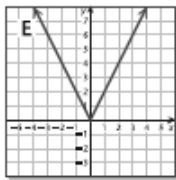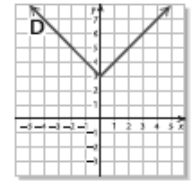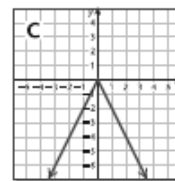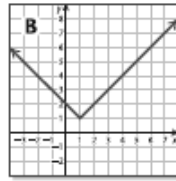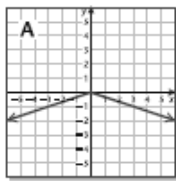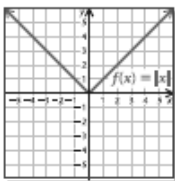
14. Use the graph of $f(x)$ to find a possible formula for the transformation of f shown.
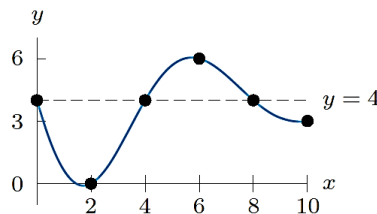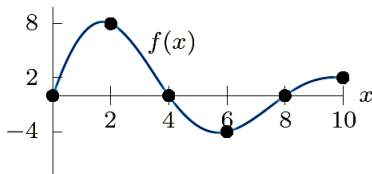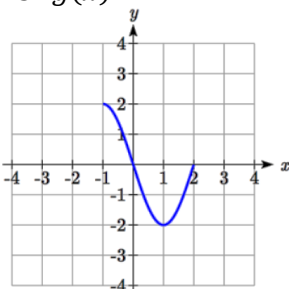
The graph of the parent function $y = f(x)$ is shown (below). The functions $g(x)$ & $h(x)$ are transformations of $f(x)$. Find formulas for $g(x)$ & $h(x)$ in terms of $f(x)$.
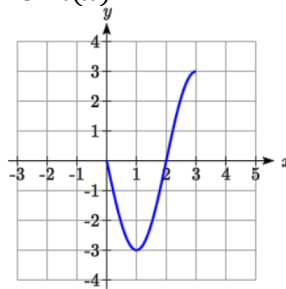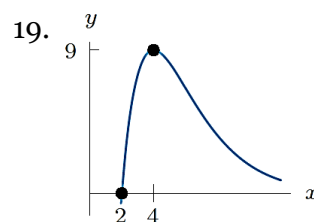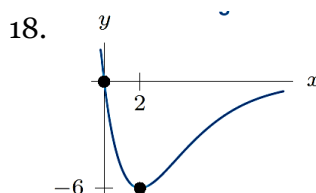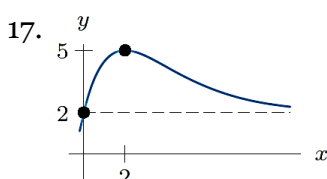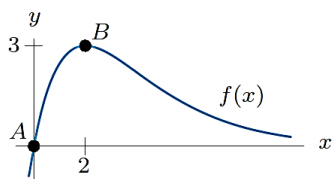
$$y = f(x)$$

15. $g(x)$

16. $h(x)$

Describe the transformation(s) that have been applied to the graph of $f(x)$. Then write a formula in terms of $f(x)$ for the graph shown.

17.

18.

19.

Match the transformation of the function $y = f(x)$ with a graph.

20. $y = 2f(x)$

21. $y = \dfrac{1}{3}f(x)$

22. $y = -f(x + 1)$

23. $y = f(x + 2) + 1$

24. $y = f(-x)$

(a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

(i)

Chapter 3: Transformations of Functions