

Name the parent function. Then describe the transformation (translation, scale, and reflection) of the function if it exists.

<u>Translation</u> Vertical Shift up/down ? Horizontal Shift right/left ?	<u>Scale</u> Vertical Stretch/Shrink of ? Horizontal Stretch/Shrink of ?	<u>Reflection</u> About the x-axis About the y-axis
1. $y = 2(x + 1)^3$ NAME: <u>cubic</u> Translation: <u>horizontal shift left 1</u> Scale: <u>vertical stretch 2</u> Reflection: <u>none</u>	2. $y = -(x - 11)^2 - 5$ NAME: <u>quadratic</u> <u>vertical shift down 5</u> Translation: <u>horizontal shift right 11</u> Scale: <u>none</u> Reflection: <u>reflect about x-axis</u>	3. $f(x) = 3x - 6 + 8$ $y = 3(x - 2) + 8$ NAME: <u>absolute value</u> <u>vertical shift up 8</u> Translation: <u>horizontal shift right 2</u> Scale: <u>horizontal shrink of 1/3</u> Reflection: <u>none</u>
4. $f(x) = -\frac{1}{2}\sqrt{5 - x}$ $y = -\frac{1}{2}\sqrt{(x - 5)}$ NAME: <u>square root</u> Translation: <u>horizontal shift right 5</u> Scale: <u>vertical shrink of 1/2</u> Reflection: <u>reflect about x-axis & y-axis</u>	5. $y = \log_2(-x) + 4$ NAME: <u>logarithmic</u> Translation: <u>vertical shift up 4</u> Scale: <u>none</u> Reflection: <u>reflect about y-axis</u>	6. $f(x) = \frac{1}{3}e^{x-1} - 4$ NAME: <u>exponential</u> <u>vertical shift down 4</u> Translation: <u>horizontal shift right 1</u> Scale: <u>vertical shrink of 1/3</u> Reflection: <u>none</u>
7. $y = -\frac{4}{2x+3} - 19$ <u>rational</u> NAME: $y = -4\left[\frac{1}{2(x+3)}\right] - 19$ <u>vertical shift down 19</u> Translation: <u>horizontal shift left 3/2</u> Scale: <u>horizontal shrink of 1/2</u> <u>vertical stretch of 4</u> Reflection: <u>reflect about x-axis</u>	8. $f(x) = \left[\frac{1}{4}x\right] + 5$ NAME: <u>greatest integer</u> Translation: <u>vertical shift up 5</u> Scale: <u>horizontal stretch of 4</u> Reflection: <u>none</u>	9. $y = 4 - x^3$ $y = -x^3 + 4$ NAME: <u>cubic</u> Translation: <u>vertical shift up 4</u> Scale: <u>none</u> Reflection: <u>reflect about x-axis</u>

Given the parent function $f(x) = |x|$, write the equation of the following transformation...

10. Vertical shift up 3 and horizontal shift right 2 $y = x - 2 + 3$	11. Horizontal shift left 3, vertical stretch of 4 $y = 4 x + 3 $	12. Reflect about y-axis, vertical shift up 2, horizontal stretch of 5 $y = -\frac{1}{5}x + 2$
---------------------------------------------------------------------------	----------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------

Given the parent function $f(x) = x^3$, write the equation of the following transformation...

13. Reflect about the x-axis, horizontal shift right 2, vertical shrink of $\frac{1}{2}$ $y = -\frac{1}{2}(x - 2)^3$	14. Horizontal shrink of $\frac{1}{4}$, vertical shift down 6 $y = (4x)^3 - 6$	15. horizontal shift left 4, vertical shift down 7, horizontal stretch of 8 $y = \left[\frac{1}{8}(x + 4)\right]^3 - 7$
-------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------

Given the parent function $f(x) = \frac{1}{x}$, write the equation of the following transformation...

16. Horizontal shift left 3, reflect about x-axis.

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

17. Vertical shift up 5

$$y = \frac{1}{x} + 5$$

18. Vertical stretch 3, horizontal shift right 5

$$y = \frac{3}{x-5}$$

Given the parent function $f(x) = e^x$, write the equation of the following transformation...

19. Reflect about the y-axis and horizontal shift right 8

$$y = e^{(8-x)}$$

20. Horizontal shrink of $\frac{1}{2}$ and reflect about the x-axis

$$y = -e^{(2x)}$$

21. Vertical stretch of 6, vertical shift down 3, horizontal shift right 5, reflect about x-axis

$$y = -6e^{(x-5)} - 3$$

Given the parent function $f(x) = \log_2 x$, write the equation of the following transformation...

22. Horizontal shift right 3, vertical shift down 5

$$y = \log_2(x-3) - 5$$

23. Reflect about the x-axis and vertical shift up 5

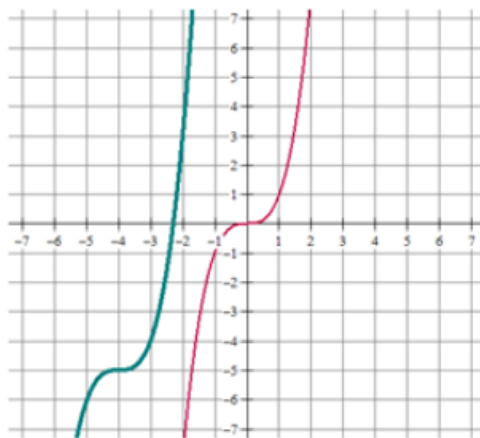
$$y = -\log_2(x) + 5$$

24. Vertical stretch of 5, reflect about the y-axis, horizontal stretch of 3

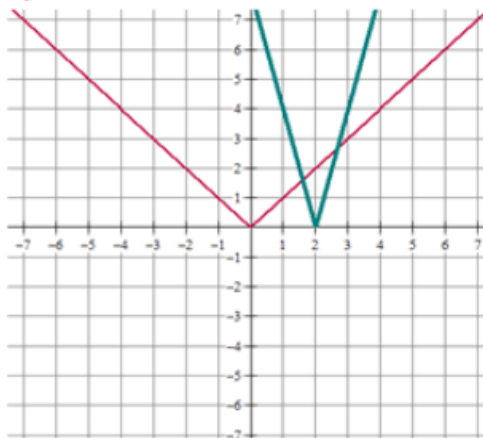
$$y = 5 \log_2\left(-\frac{1}{3}x\right)$$

The graph of a parent function and a transformation of the parent function are given. Write the equation of the transformed function.

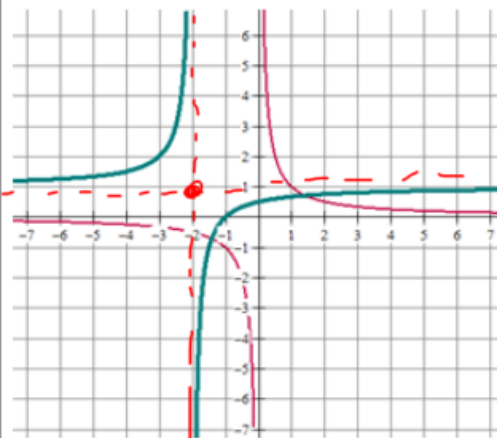
25. $y = (x+4)^3 - 5$



26. $y = 4|x-2|$ or $y = |4(x-2)|$

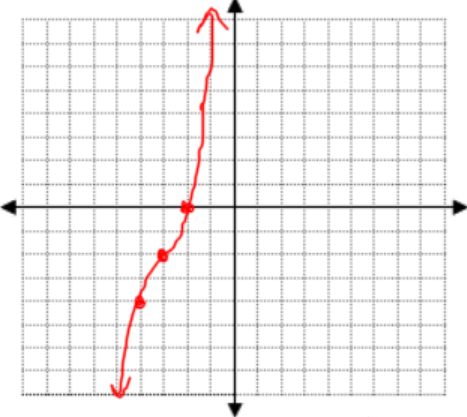


27. $y = -\frac{1}{x+2} + 1$



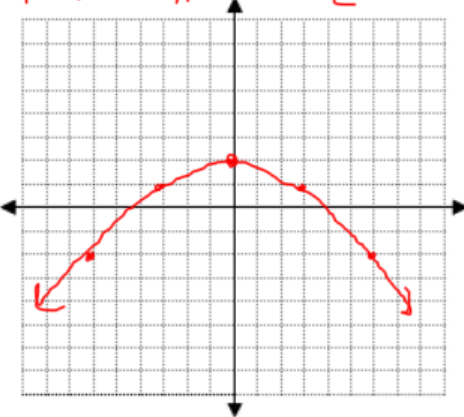
Sketch a graph of the following.

28. $y = 2(x+3)^3 - 2$ $\left\{ \begin{array}{l} \leftarrow \\ \downarrow \end{array} \right.$
 vertical stretch: 2



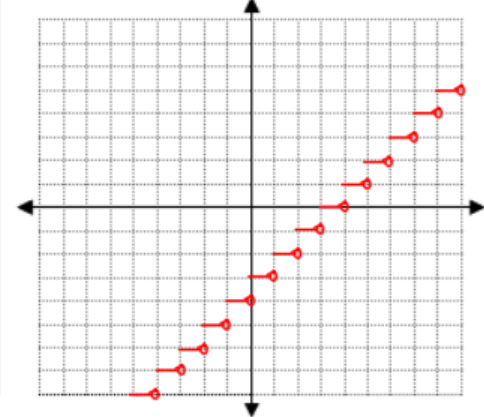
x	-3	-2	-4	-1
y	-2	-14	14	

29. $f(x) = -\left(\frac{1}{3}x\right)^2 + 2$ $\left\{ \begin{array}{l} \uparrow \\ \leftarrow \end{array} \right.$
 horizontal stretch 3 @ x-axis



x	0	3	-3	6	-6
y	2	1	1	-2	-2

30. $y = \lceil x - 3 \rceil$ $\left\{ \rightarrow \right.$



x	3.5	4.5	5.5	2.5	1.5
y	0	1	2	-1	-2

Match the function to its graph WITHOUT using a graphing calculator!

31. $y = 2\sqrt{x-3} + 2$ $\left\{ \begin{array}{l} \rightarrow \\ \uparrow \end{array} \right.$ F

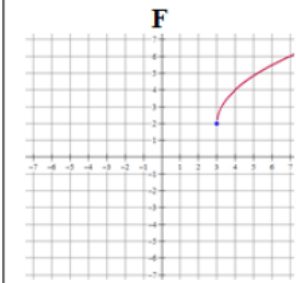
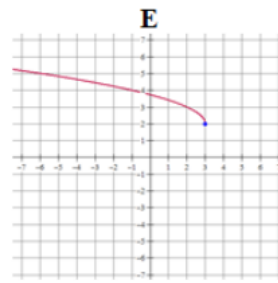
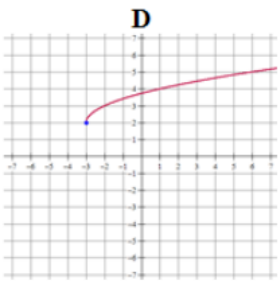
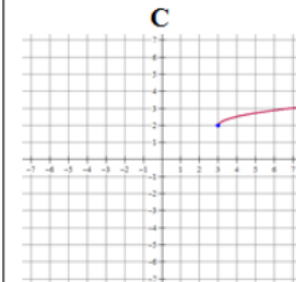
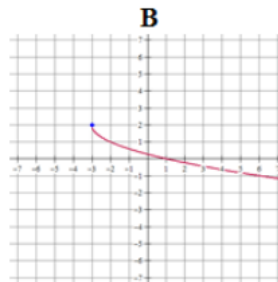
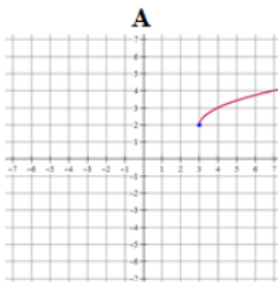
32. $y = \sqrt{x+3} + 2$ $\left\{ \begin{array}{l} \leftarrow \\ \uparrow \end{array} \right.$ D

33. $y = \sqrt{3-x} + 2$ $\left\{ \begin{array}{l} \rightarrow \\ \uparrow \end{array} \right.$ E

34. $y = \sqrt{x-3} + 2$ $\left\{ \begin{array}{l} \rightarrow \\ \uparrow \end{array} \right.$ A

35. $y = -\sqrt{x+3} + 2$ $\left\{ \begin{array}{l} \leftarrow \\ \uparrow \end{array} \right.$ B

36. $y = 0.5\sqrt{x-3} + 2$ $\left\{ \begin{array}{l} \rightarrow \\ \uparrow \end{array} \right.$ C



REVIEW SKILLS

Use the quadratic formula to solve. Express your solution(s) in exact and decimal form.

1. $11x^2 + 12x = 6$
 $-6 \quad -6$
 $11x^2 + 12x - 6 = 0$
 $\frac{-12 \pm \sqrt{12^2 - 4(11)(-6)}}{2(11)} = \frac{-12 \pm \sqrt{408}}{22} = \frac{-12 \pm 2\sqrt{102}}{22}$
 $\frac{2(-6 \pm \sqrt{102})}{22} = \frac{-6 \pm \sqrt{102}}{11}$

$\frac{-6 + \sqrt{102}}{11}$ or $\frac{-6 - \sqrt{102}}{11}$
 0.373 or -1.464

2. $x^2 - 2x + 7 = 0$
 $\frac{2 \pm \sqrt{(-2)^2 - 4(1)(7)}}{2(1)} = \frac{2 \pm \sqrt{-24}}{2} = \frac{2 \pm 2i\sqrt{6}}{2}$
 $\frac{2(1 \pm i\sqrt{6})}{2} = 1 \pm i\sqrt{6}$

$1 + i\sqrt{6}$ or $1 - i\sqrt{6}$
 $1 + 2.449i$ or $1 - 2.449i$