

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

Translation

Vertical Shift up/down ?  
Horizontal Shift right/left ?

Scale

Vertical Stretch/Shrink of ?  
Horizontal Stretch/Shrink of ?

Reflection

About the x-axis  
About the y-axis

1.  $y = 2(x + 1)^3$

NAME: Cubic

Translation: left 1

Scale: Vertical stretch of 2

Reflection: N/A

2.  $y = -(x - 11)^2 - 5$

NAME: QUADRATIC

Translation: right 11, down 5

Scale: N/A

Reflection: Reflect about x-axis

3.  $f(x) = |3x - 6| + 8$   
 $= |3(x-2)| + 8$

NAME: ABSOLUTE VALUE

Translation: right 2, up 8

Scale: Horizontal shrink  $\frac{1}{3}$ 

Reflection: N/A

4.  $f(x) = -\frac{1}{2}\sqrt{5-x}$   
 $= -\frac{1}{2}\sqrt{-(x-5)}$

NAME: SQUARE ROOT

Translation: RIGHT 5

Scale: Vertical shrink of  $\frac{1}{2}$ Reflection: Reflect about x-axis  
Reflect about y-axis

5.  $y = \log_2(-x) + 4$

NAME: LOGARITHMIC

Translation: UP 4

Scale: N/A

Reflection: Reflect about y-axis

6.  $f(x) = \frac{1}{3}e^{x-1} - 4$

NAME: EXPONENTIAL

Translation: RIGHT 1, Down 4

Scale: Shrink vertically by  $\frac{1}{3}$ 

Reflection: N/A

7.  $y = -\frac{4}{2x+3} - 19$   
 $= -4 \cdot \frac{1}{2(x+\frac{3}{2})} - 19$

NAME: RATIONALTranslation: Left  $\frac{3}{2}$ , down 19Scale: Vertical stretch of 4 and  
Horizontal shrink  $\frac{1}{2}$ 

Reflection: Reflect about x-axis

8.  $f(x) = \left\lceil \frac{1}{4}x \right\rceil + 5$

NAME: GREATEST INTEGER

Translation: UP 5

Scale: Horizontal stretch of 4

Reflection:

9.  $y = 4 - x^3$   
 $y = -x^3 + 4$

NAME: CUBIC

Translation: UP 4

Scale: N/A

Reflection: Reflect about x-axis

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

10. Vertical shift up 3 and horizontal shift right 2

$f(x) = |x-2| + 3$

11. Horizontal shift left 3, vertical stretch of 4

$f(x) = 4|x+3|$

12. Reflect about y-axis, vertical shift up 2, horizontal stretch of 5

$y = \left| -\frac{1}{5}x \right| + 2$

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  $\frac{1}{2}$ 

$f(x) = -\frac{1}{2}(x-2)^3$

14. Horizontal shrink of  $\frac{1}{4}$ , vertical shift down 6

$f(x) = (4x)^3 - 6$

15. horizontal shift left 4, vertical shift down 7, horizontal stretch of 8

$f(x) = \left[ \frac{1}{8}(x+4) \right]^3 - 7$

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.  
 $f(x) = -\frac{1}{x+3}$

17. Vertical shift up 5  
 $f(x) = \frac{1}{x} + 5$

18. Vertical stretch 3, horizontal shift right 5  
 $f(x) = 3\frac{1}{x-5}$

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

20. Horizontal shrink of  $\frac{1}{2}$  and reflect about the  $x$ -axis  
 $f(x) = -e^{2x}$

21. Vertical stretch of 6, vertical shift down 3, horizontal shift right 5, reflect about  $x$ -axis  
 $f(x) = -6e^{x-5} - 3$

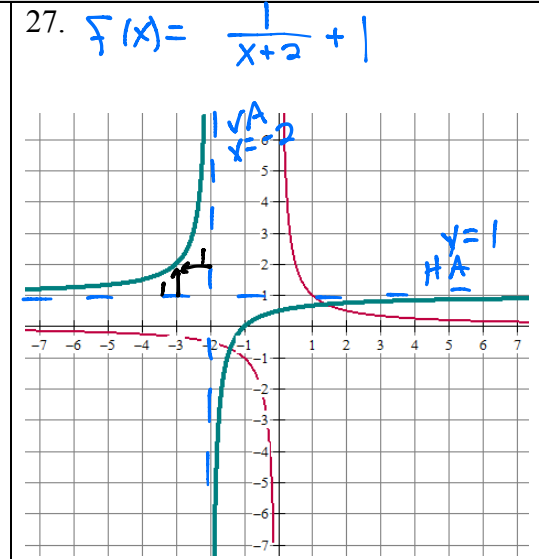
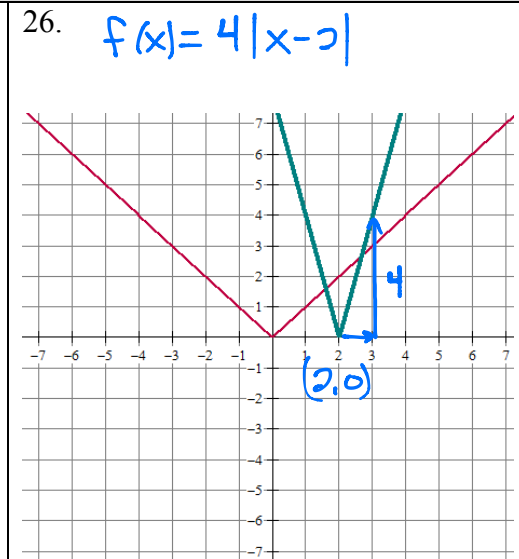
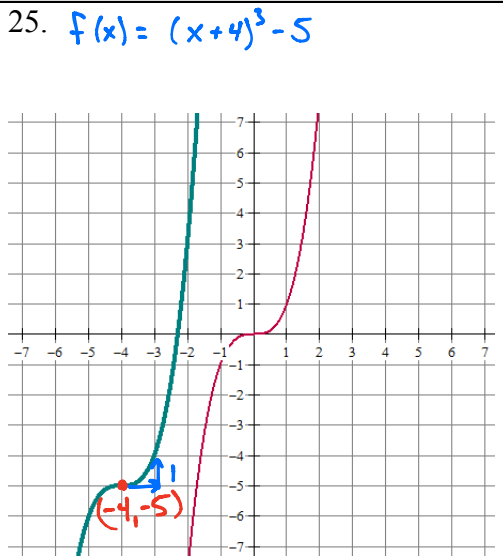
Given the parent function  $f(x) = \log_2 x$ , write the equation of the following transformation...

22. Horizontal shift right 3, vertical shift down 5  
 $f(x) = \log_2(x-3) - 5$

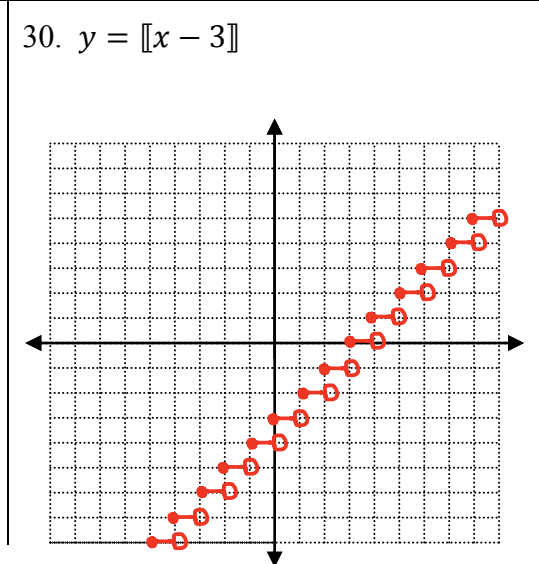
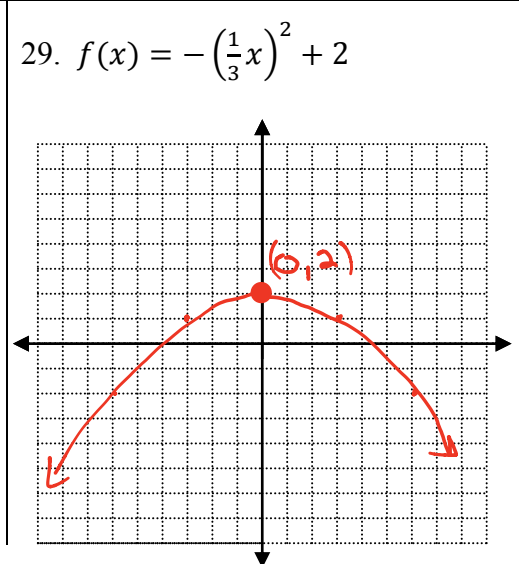
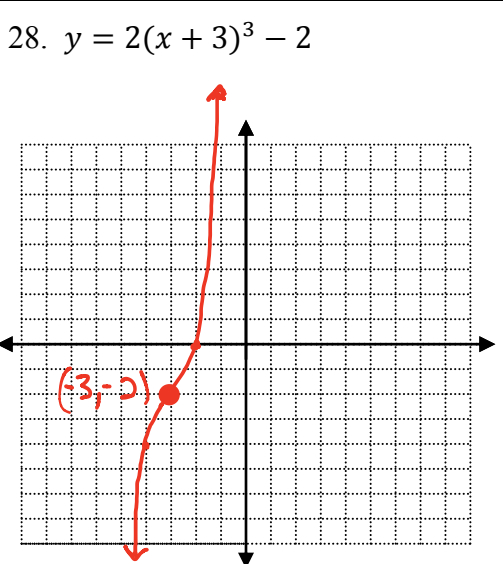
23. Reflect about the  $x$ -axis and vertical shift up 5  
 $f(x) = -\log_2 x + 5$

24. Vertical stretch of 5, reflect about the  $y$ -axis, horizontal stretch of 3  
 $y = 5\log_2(-\frac{1}{3}x)$

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



Sketch a graph of the following.



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

31.  $y = 2\sqrt{x-3} + 2$  **F**

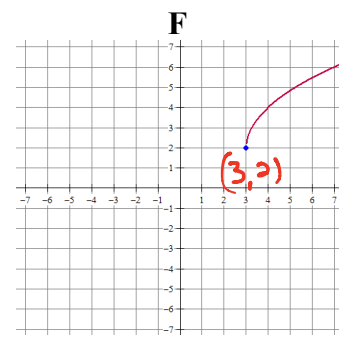
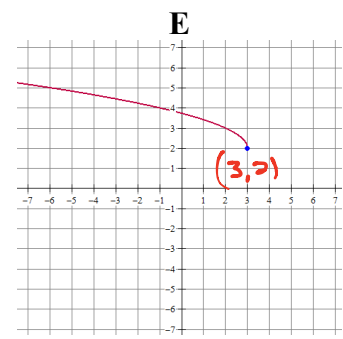
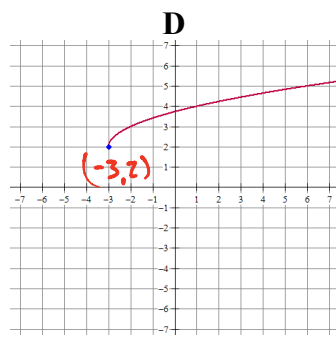
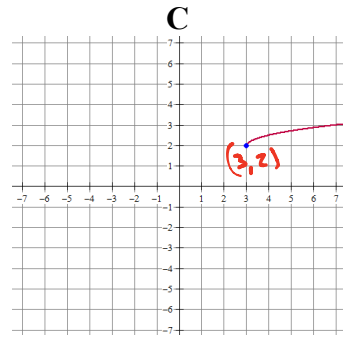
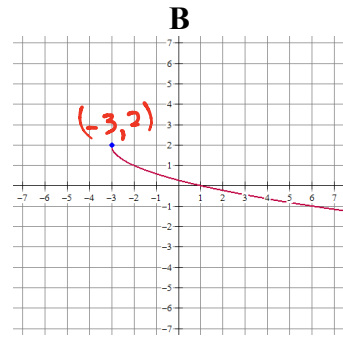
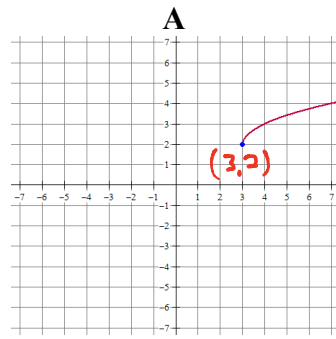
32.  $y = \sqrt{x+3} + 2$  **D**

33.  $y = \sqrt{3-x} + 2$  **E**

34.  $y = \sqrt{x-3} + 2$  **A**

35.  $y = -\sqrt{x+3} + 2$  **B**

36.  $y = 0.5\sqrt{x-3} + 2$  **C**



REVIEW SKILLS

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

1.  $11x^2 + 12x = 6$

$11x^2 + 12x - 6 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-12 \pm \sqrt{(12)^2 - 4(11)(-6)}}{2(11)}$$

$$= \frac{-12 \pm \sqrt{144 + 264}}{22}$$

$$= \frac{-12 \pm \sqrt{408}}{22}$$

$$= \frac{-12 \pm 2\sqrt{102}}{22}$$

$x = \frac{2(-6 \pm \sqrt{102})}{22}$

$x = \frac{-6 \pm \sqrt{102}}{11}$

$x \approx .373, -1.464$

$\sqrt{408}$   
 $\sqrt{8 \cdot 51}$   
 $\sqrt{2 \cdot 2 \cdot 3 \cdot 17}$   
 $2\sqrt{2 \cdot 3 \cdot 17}$

2.  $x^2 - 2x + 7 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(7)}}{2(1)}$$

$$= \frac{2 \pm \sqrt{4 - 28}}{2}$$

$$= \frac{2 \pm \sqrt{-24}}{2}$$

$$x = \frac{2 \pm 2i\sqrt{6}}{2}$$

$x = \frac{2(1 \pm i\sqrt{6})}{2}$

$x = 1 \pm i\sqrt{6}$

$x \approx 1 \pm 2.449i$