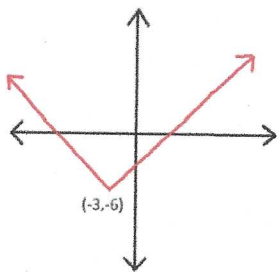
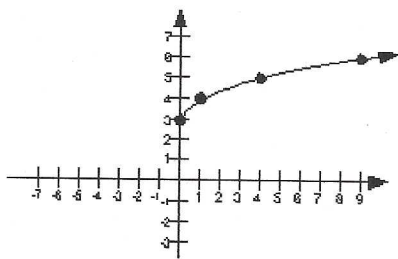


ALG CC ZOOM #8
Unit 16 Review A – Other Functions

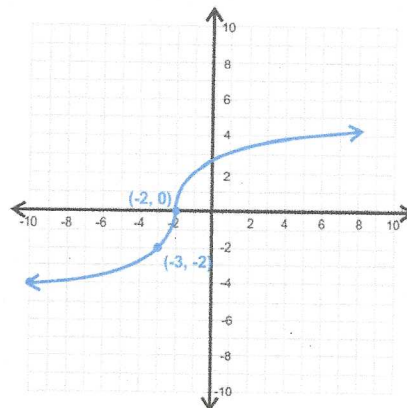
1. Name the function family that each graph belongs to.



absolute value
 $y = |x|$



square root
 $y = \sqrt{x}$



cube root
 $y = \sqrt[3]{x}$

2. Describe how the parent function is transformed.

- a. $f(x) = |x|$ to $f(x) = |x - 8|$ horizontal shift 8 units to the right.
- b. $f(x) = x^2$ to $f(x) = x^2 + 3$ vertical shift 3 units up.
- c. $f(x) = \sqrt{x}$ to $f(x) = 5\sqrt{x}$ vertical stretch by a factor of 5.
- d. $f(x) = x^3$ to $f(x) = -(x + 4)^3$ horizontal shift 4 units left and a flip over x-axis.
- e. $f(x) = |x|$ to $f(x) = |x - 12| + 7$ horizontal shift 12 units right + vertical shift 7 units up.

3. State the domain of each function.

a. $f(x) = \sqrt{x+3}$

$$\begin{array}{r} x+3 \geq 0 \\ -3 \quad -3 \\ \hline x \geq -3 \text{ or } [-3, \infty) \end{array}$$

b. $f(x) = \sqrt{7-x}$

$$\begin{array}{r} 7-x \geq 0 \\ -7 \quad -7 \\ \hline -x \geq -7 \\ \frac{-x}{-1} \geq \frac{-7}{-1} \\ x \leq 7 \text{ or } (-\infty, 7] \end{array}$$

4. Find the average rate of change of $f(x) = x^2 + 5$ over the interval $3 \leq x \leq 6$

$$\begin{aligned} \frac{\Delta y}{\Delta x} &= \frac{41-14}{6-3} \\ &= \frac{27}{3} \end{aligned}$$

AVG. R.O.C. = 9

$$\begin{aligned} 3^2 + 5 \\ 6^2 + 5 \end{aligned}$$

x	y
3	14
6	41

5. Given the parent function is $f(x) = \sqrt{x}$, write the new function $h(x)$ when the parent function has been translated 6 units to the left, compressed vertically by a factor of $\frac{1}{3}$ and translated 9 units up.

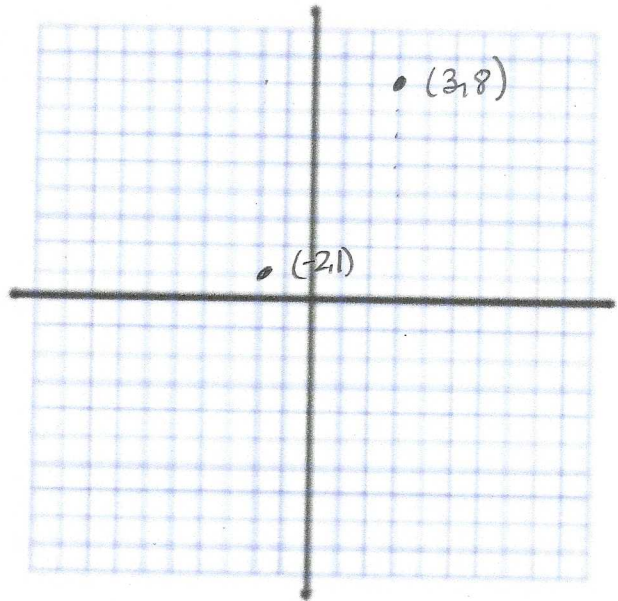
$$h(x) = \frac{1}{3}\sqrt{x+6} + 9$$

6. If $(3, 8)$ is the turning point on the graph $y = f(x)$, what is the turning point of the graph $y = f(x + 5) - 7$?

5 left ↓ down 7
 (-5) (-7)

$$\begin{array}{r} (3, 8) \\ -5 \quad -7 \\ \hline (-2, 1) \end{array}$$

Use of grid is optional.



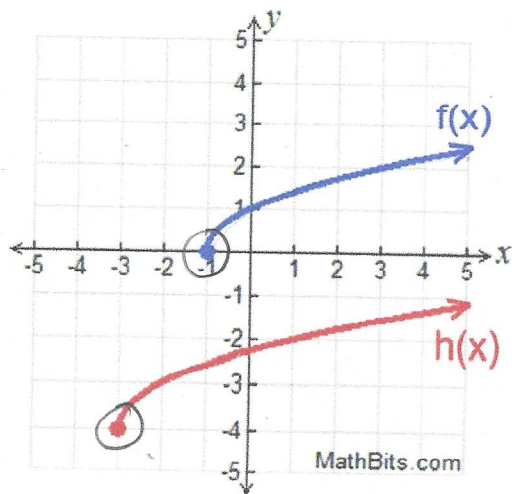
7. Consider the graph of $y = f(x)$ shown below. Which transformation describes the graph of $y = h(x)$.

(A) $h(x) = f(x - 2) - 4$

(B) $h(x) = f(x + 2) - 4$

(C) $h(x) = f(x - 2) + 4$

(D) $h(x) = f(x + 2) + 4$

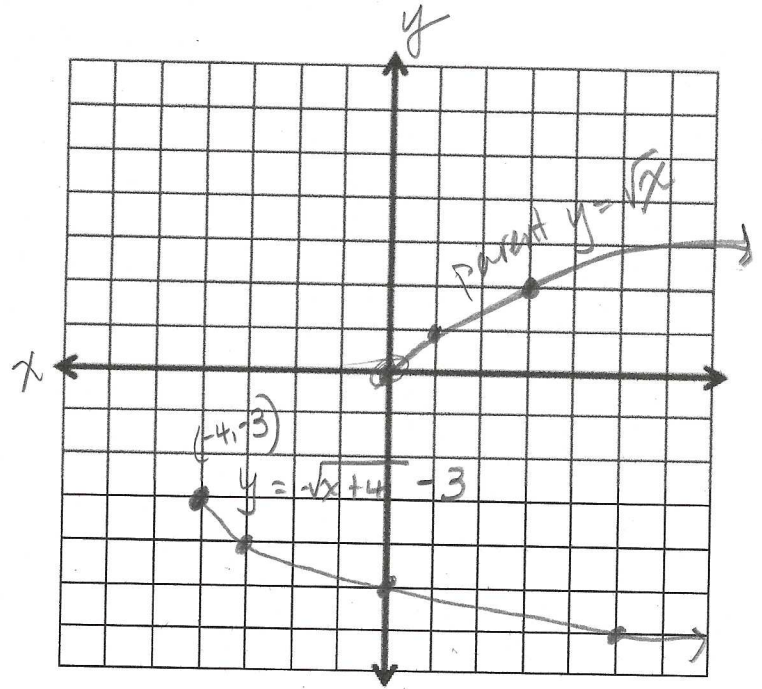


left 2
down 4

8. Graph the following function.

$$y = -\sqrt{x+4} - 3$$

x	y
-4	-3
-3	-4
0	-5
5	-6



State the domain. ^{x-values.} $x \geq -4$ or $[-4, \infty)$

State the range. ^{y-values} $y \leq -3$ or $(-\infty, -3]$