Unit 6 Quest Study Guide

Name: key

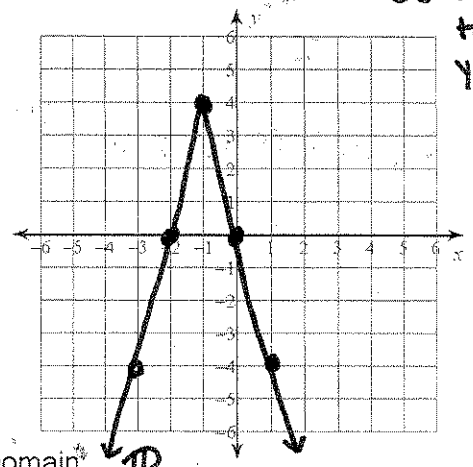
In order to be prepared for the quest, you should:

-Be able to match the name of a function to the equation of its parent functions
-Be able to determine the domain and range of a function
-Be able to graph absolute value, square root, cube root, and "reciprocal/rational/inverse variation" functions
-Know your transformations

Practice Problems:

For each of the following, graph the function, identify any asymptotes, state the domain, range, and any transformations from the parent function.

7) $y = -2|2x + 2| + 4$ → just FYI, can be manipulated to $y = -2|2(x+1)| + 4$

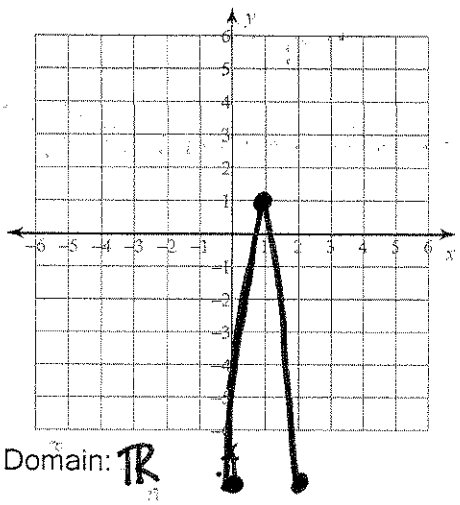


Domain: $\mathbb{R}$

Range: $y \leq 4$

★Transformation from parent: reflected, vertical/horizontal stretch by 2, left 1, up 4

8) $y = -3|3x - 3| + 1 = -3|3(x-1)| + 1$

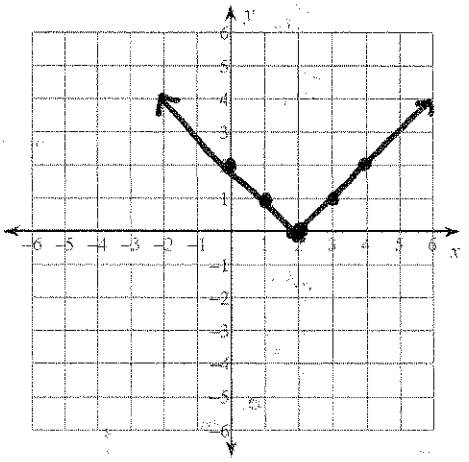


Domain: $\mathbb{R}$

Range: $y \leq 1$

★Transformation from parent: reflected, vertical/horizontal stretch by 3, right 1 up 1

3) $y = |x - 2|$

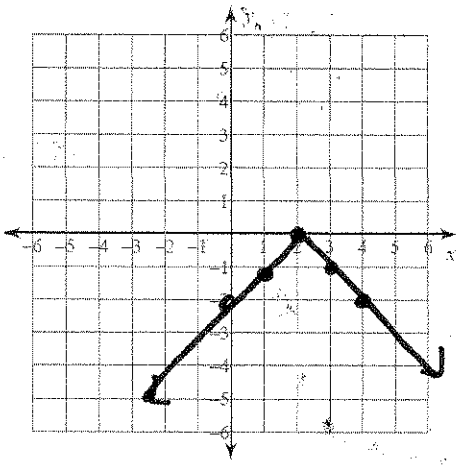


Domain: $\mathbb{R}$

Range: $y \geq 0$

Transformation from parent: right 2

4) $y = -|x - 2|$

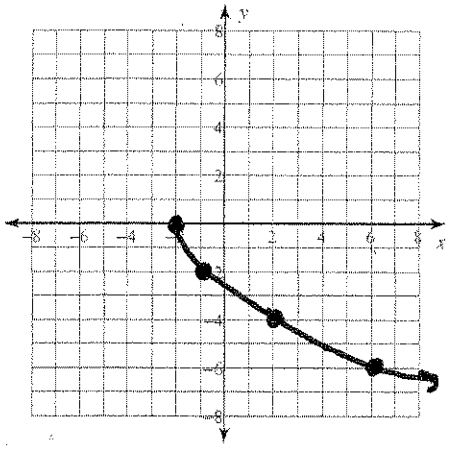


Domain: $\mathbb{R}$

Range: $y \leq 0$

Transformation from parent: reflected, right 2

9) $y = -2\sqrt{x+2}$

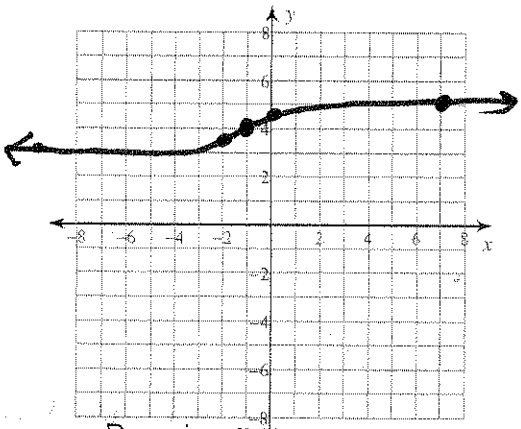


Domain: $x \geq -2$

Range: $y \leq 0$

Transformation from parent: reflected, stretched by 2, left 2

10) $y = \frac{1}{2}\sqrt[3]{x+1} + 4$

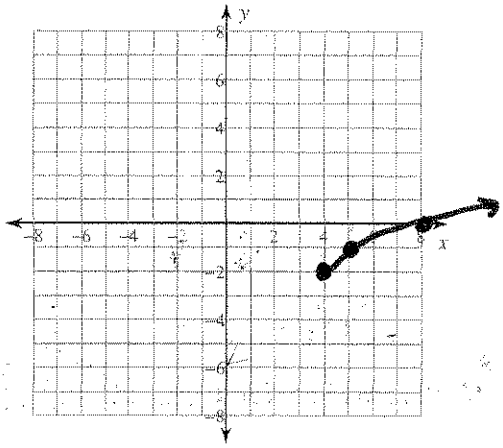


Domain: $\mathbb{R}$

Range: $\mathbb{R}$

Transformation from parent: compress by ½, left 1, up 4

11) $y = \sqrt{x-4} - 2$

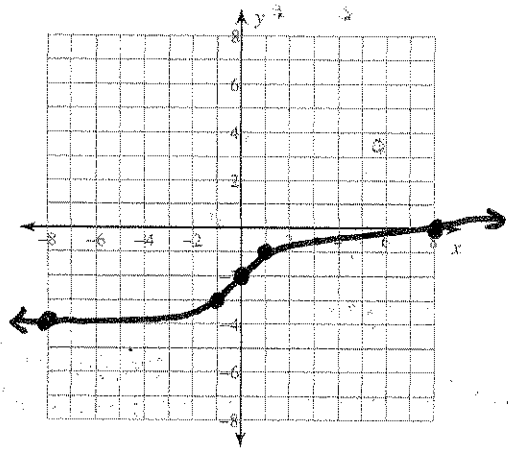


Domain: $x \geq 4$

Range: $y \geq -2$

Transformation from parent: right 4, down 2

12) $y = -2 + \sqrt[3]{x}$

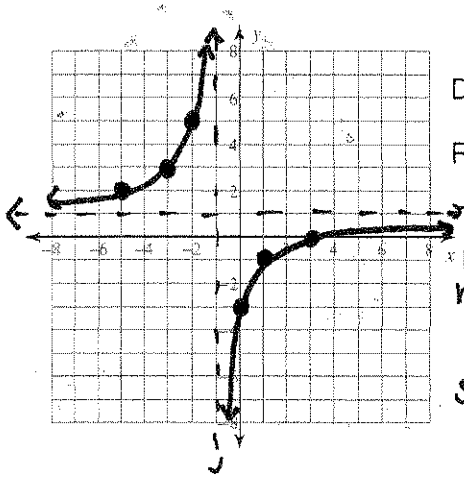


Domain: $\mathbb{R}$

Range: $\mathbb{R}$

Transformation from parent: down 2

9) $f(x) = -\frac{4}{x+1} + 1$

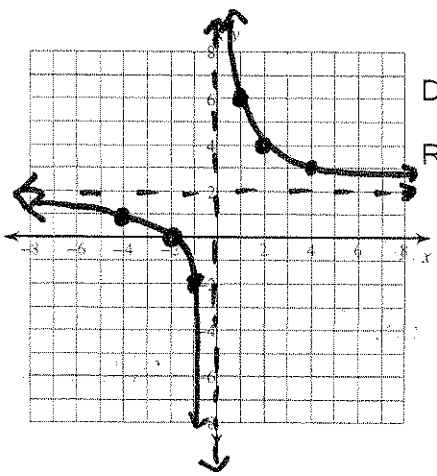


Domain: $x \neq -1$

Range: $y \neq 1$

Transformation from parent: reflected, left 1, up 1, stretched by 4

10) $f(x) = \frac{4}{x} + 2$

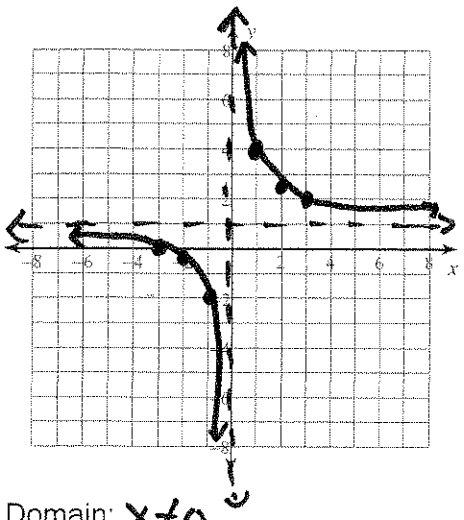


Domain: $x \neq 0$

Range: $y \neq 2$

Transformation from parent: stretched by 4, up 2

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

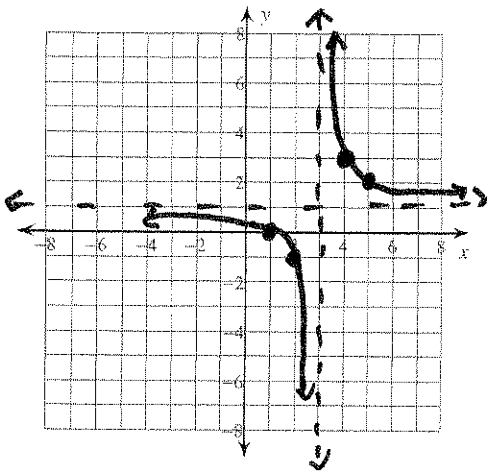


Domain: $x \neq 0$

Range: $y \neq 1$

Transformation from parent:
Stretch by 3
up 1

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



Domain: $x \neq 3$

Range: $y \neq 1$

Transformation from parent:
Stretch by 2
right 3, up 1

Solve the following. Don't forget to check for extraneous solutions:

5) $5=\sqrt{r-3}$

$(5)^2=(\sqrt{r-3})^2$

$25=r-3$

$+3 \quad +3$

$r=28$

6) $\sqrt{2m-6}=\sqrt{3m-14}$

$(\sqrt{2m-6})^2=(\sqrt{3m-14})^2$

$2m-6=3m-14$

$-2m+14 \quad -2m+14$

$8=m$

7) $\sqrt{8k}=k$

$(\sqrt{8k})^2=k^2$

$8k=k^2$

$-k \quad -k$

$\frac{7k}{7}=\frac{0}{7}$

$k=0$

8) $\sqrt{9-b}=\sqrt{1-9b}$

$(\sqrt{9-b})^2=(\sqrt{1-9b})^2$

$9-b=1-9b$

$+9b \quad +9b$

$9+8b=1$

$-9 \quad -9$

$\frac{8b}{8}=\frac{-8}{8}$

$b=-1$

16) $\sqrt{2v-7}=v-3$

$(\sqrt{2v-7})^2=(v-3)^2$

$2v-7=v^2-6v+9$

$-2v+7 \quad -2v+7$

$0=v^2-8v+16 \rightarrow 0=(v-4)(v-4) \rightarrow v=4$

$-4 \times -4 = 16$, $-8$

| $\times$ | $x$ | $-4$ |
|---|---|---|
| $x$ | $x^2$ | $-4x$ |
| $-4$ | $-4x$ | $16$ |

$\sqrt{2(4)-7}=4-3$

$\sqrt{8-7}=1$

$\sqrt{1}=1$ ✓