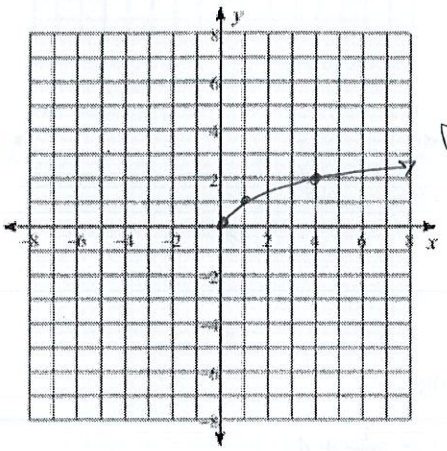
Name Key Period _____

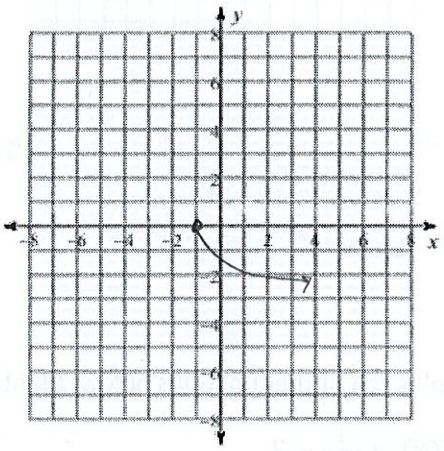
Identify the domain and range of each. Then sketch the graph.

1) $y = \sqrt{x}$



D: $[0, \infty)$ $x \geq 0$
R: $[0, \infty)$ $y \geq 0$

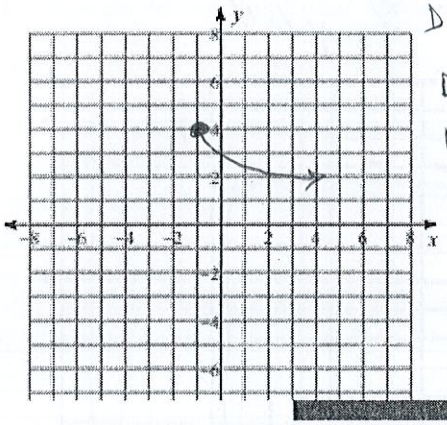
2) $y = -\sqrt{x+1}$



D: $x \geq -1$
R: $y \leq 0$

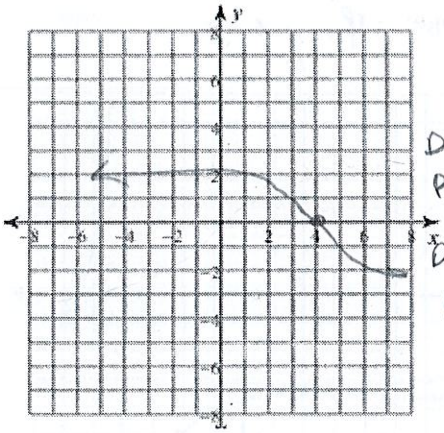
D: $[-1, \infty)$
R: $(0, -\infty)$

3) $y = -\sqrt{x+1} + 4$



D
D: $[-1, \infty)$ $x \geq -1$
R: $[4, -\infty)$ $y \leq 4$

4) $y = -\sqrt[3]{x} - 4$

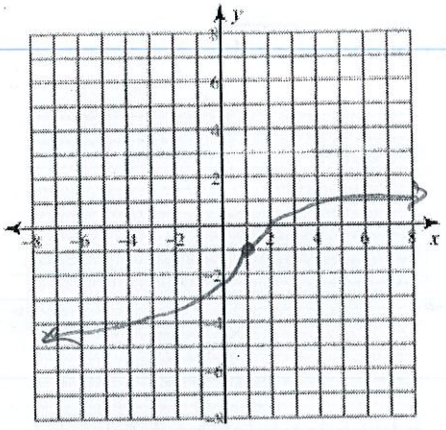


D: $\mathbb{R}$
R: $\mathbb{R}$

D: $(-\infty, \infty)$
R: $(-\infty, \infty)$

Name _____ Period _____

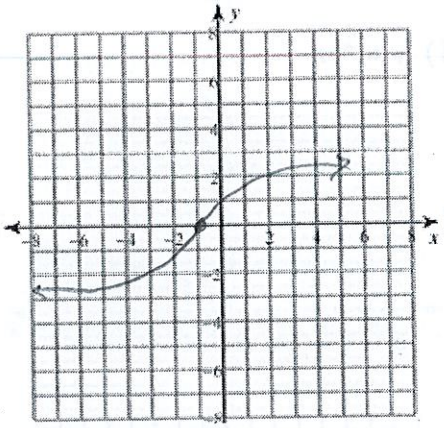
5) $y = \sqrt[3]{x-1} - 1$



D: ℝ
R: ℝ

D: $-\infty, \infty$
R: $-\infty, \infty$

6) $y = \sqrt[3]{x+1}$



D: ℝ
R: ℝ

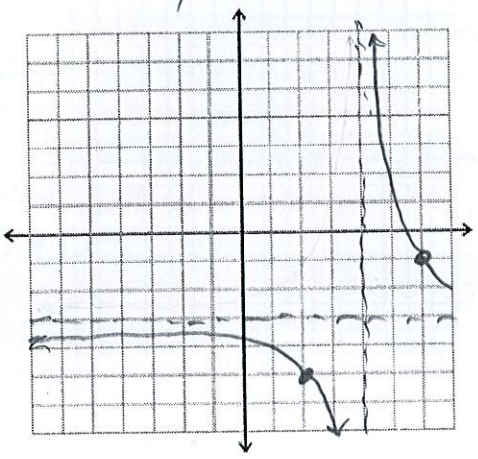
D: $(-\infty, \infty)$
R: $(-\infty, \infty)$

Graph each of the functions below. Identify the domain and range.

7) $f(x) = \frac{4}{x-4} - 3$

Domain: ℝ $x \neq 4$

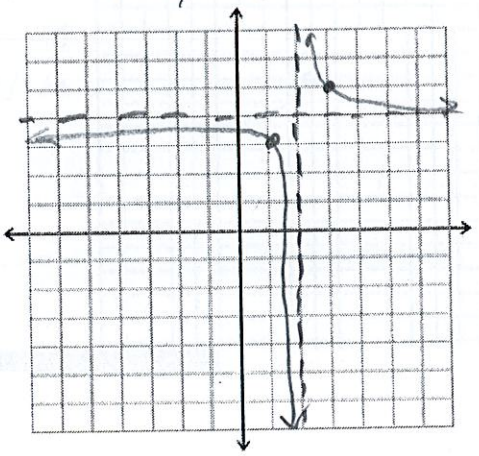
Range: ℝ $y \neq -3$



8) $f(x) = \frac{1}{x-2} + 4$

Domain: ℝ $x \neq 2$

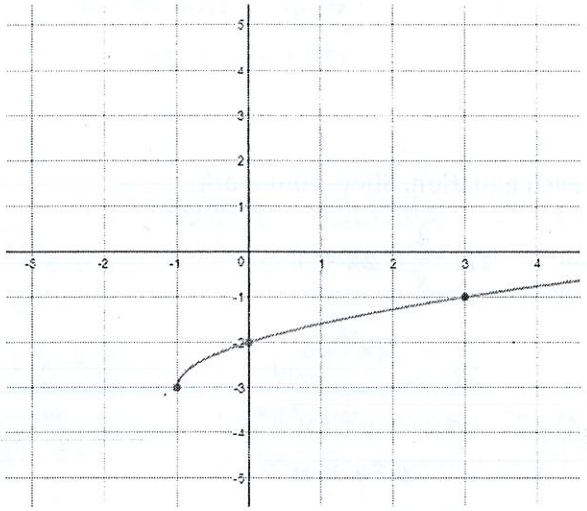
Range: ℝ $y \neq 4$



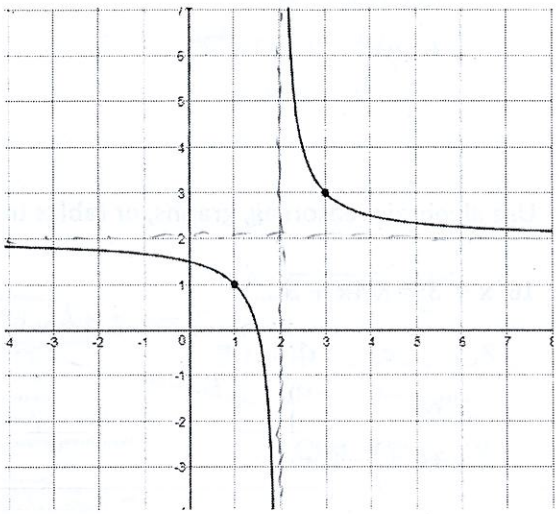
Name _____ Period _____

Write the equation for each graph.

9. $y = \sqrt{x+1} - 3$



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



11. The frequency of a vibrating guitar string varies inversely as its length. Suppose a guitar string 0.65 meters long vibrates 4.3 times per second. What frequency would a string 0.5 meters long have?

$xy = k$

$.65(4.3) = k$

2.795 meters/second

$xy = k$

$\frac{.5y}{.5} = \frac{2.795}{.5}$

$y = 5.59$

12. y varies directly with x. If y = -6 when x =2, find y when x = -6.

$y = kx$ $k = -3$

$-6 = k2$

$y = kx$

$y = -3(-6)$

$y = 18$

13.

A marathon is roughly 26.2 miles long. Which equation could be used to determine the time, t, it takes to run a marathon as a function of the average speed, s, of the runner where t is in hours and s is in miles per hour?

A $t = 26.2 - 26.2s$

B $t = 26.2 - \frac{s}{26.2}$

C $t = 26.2s$

D $t = \frac{26.2}{s}$

Name _____ Period _____

Describe the transformations of the following graphs compared to the parent functions.

14. $y = -\sqrt{x-3}+5$

reflect over x-axis
right 3 units
up 5 units

15. $y = \sqrt{-x-2}-1$

reflects over the y-axis
right two units
down 1 unit

Use algebraic reasoning, graphs, or tables to solve each equation. Show your work.

DON'T WORRY ABOUT

16. $(x+3)^2 = (\sqrt{4x+5})^2$

$x^2+6x+9 = 4x+5$
$-4x \quad -5 \quad -4x \quad -5$
$x^2+2x+4=0$

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

$\frac{-2 \pm \sqrt{4-16}}{2}$

$\frac{-2 \pm \sqrt{-12}}{2} \leftarrow \sqrt{4}\sqrt{3}$

$\frac{-2 \pm 2i\sqrt{3}}{2}$

$= -1 \pm i\sqrt{3}$

17. $\frac{4}{x} = 2x+1$

$\frac{4}{-4} = \frac{2x^2+x}{-4}$

$0 = 2x^2+x-4$

x^2+x-8

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

$\frac{-1 \pm \sqrt{1+32}}{4}$

$\frac{-1 \pm \sqrt{33}}{4}$

Find the inverse for each relation.

18. { (1, -3), (-2, 3), (5, 1), (6, 4) }

$(-3,1)(3,-2)(1,5)(4,6)$

19. { (-5, 7), (-6, -8), (1, -2), (10, 3) }

$(7,-5)(-8,-6)(-2,1)(3,10)$

Find an equation for the inverse for each of the following relations.

20. $y = 3x+2$

① switch x and y
② solve for y

$x = 3y+2$
$-2 \quad -2$

$\frac{x-2}{3} = \frac{3y}{3}$

$\frac{x-2}{3} = y$

21. $y = \frac{3}{4}x+5$

$x = \frac{3}{4}y+5$
$-5 \quad -5$

$x-5 = \frac{3}{4}y$

multiply by the reciprocal

$\frac{4}{3}(x-5) = y$

$\frac{4}{3}x - \frac{20}{3} = y$