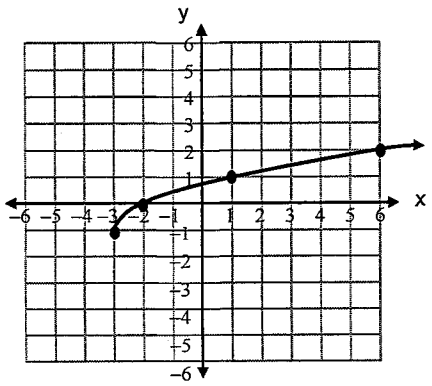
Name: _____ Date: _____ Calc. # _____
Unit 8 Review WS #22 Period: _____

1) a) Write the starting point.
b) Find the domain and range of the function:
$f(x) = \sqrt{x-3}+5$

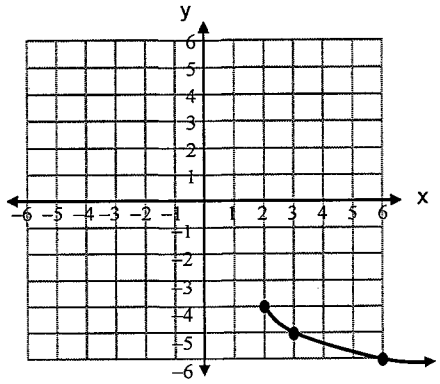
2) Find the domain, ***algebraically***, for which the $f(x) = \sqrt{2x-5}$ represents a real number.

For 3 & 4: a) Write the equation for the graph.
b) Describe the transformations from the parent function $f(x) = \sqrt{x}$
c) State the domain and range of the graph.

3)




4)




5) Solve the equation and identify any extraneous roots: $2\sqrt{\frac{x}{3}} = 4$

6) Solve the equation in ***simplest radical*** form: $3x^2 = 2(x + 2)$

7) Solve by ***completing the square***: $x^2 + 4 = 12x$

8) Solve the system of equations, ***algebraically***:

$y = 2x^2 - 4x + 1$ and $y = 7x - 4$

9) A carnival game asks participants to strike a spring with a hammer. The spring shoots a weight upward towards the bell, the participant wins a prize. Suppose that the participant strikes the spring and shoots the weight according to the model $h(t) = -16t^2 + 32t + 18$, where d is the distance in feet between the weight and the bell and t is the time in seconds since the weight was struck. If the bell is 30 feet up, find, ***algebraically***, the time the weight will hit the bell to the ***nearest tenth*** of a second.

For 10 & 11: a) Write the starting point.
b) Find the domain and range of the function:

10) $f(x) = \sqrt{x-2} - 6$

11) $f(x) = -\sqrt{x+4} + 1$

For 12 & 13, find the domain, ***algebraically***, for which the radical represents a real number.

12) $f(x) = \sqrt{4-3x}$

13) $f(x) = \sqrt{\frac{2x-9}{9}}$

Solve the equation and identify any extraneous roots:

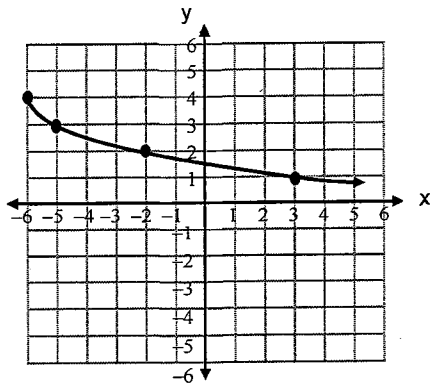
14) $6 - 3\sqrt{x} = 12$

15) $\sqrt{5x-9} + 1 = x$

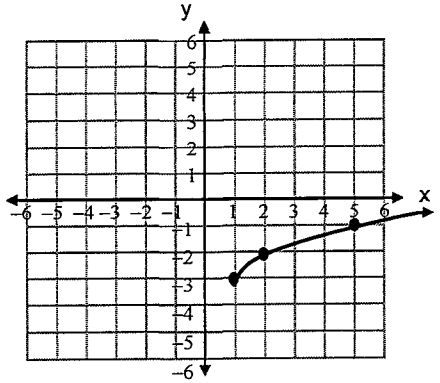
16) Solve by ***completing the square***: $x^2 = 8x + 24$

For 17 & 18: a) Write the equation for the graph.
b) Describe the transformations from the parent function $f(x) = \sqrt{x}$
c) State the domain and range of the graph.

17)




18)




Solve the equation in ***simplest radical*** form:

19) $(2x + 3)(x + 4) = 1$

20) $\frac{x-2}{x+2} = \frac{1}{x-3}$

21) Solve the system of equations, ***algebraically***, to the ***nearest hundredth***:

$y = -x^2 + 4$ and $y = x + 3$

22) A juggler throws a ball into the air from a height of 5 feet with an initial vertical velocity of 16 feet/sec. The path of the ball can be modeled by $h(t) = -16t^2 + 60t + 5$. Find ***algebraically*** how long does the juggler have to catch the ball before it hits the ground, to the ***nearest tenth*** of a second?

Name: _____ Date: _____ Calc. # _____
Unit 8 Review WS #22 Period: _____

1) a) Write the starting point.
b) Find the domain and range of the function:
$f(x) = \sqrt{x-3}+5$

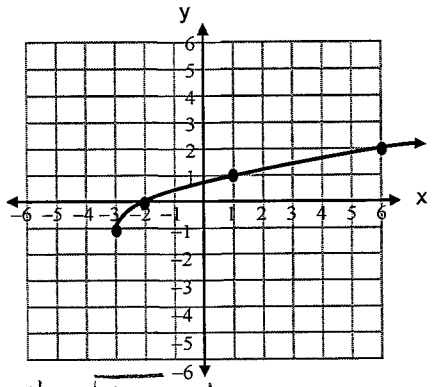
a. (3,5) b. d: $[3,\infty)$ $x \geq 3$ r: $[5,\infty)$ $y \geq 5$

2) Find the domain, ***algebraically***, for which the $f(x) = \sqrt{2x-5}$ represents a real number.

$2x - 5 \geq 0$
$+5 \quad +5$
$\frac{2x}{2} \geq \frac{5}{2}$
$x \geq \frac{5}{2}$

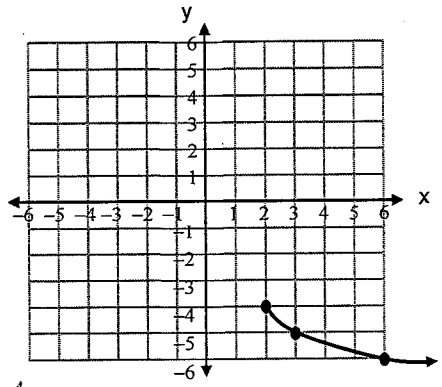
For 3 & 4: a) Write the equation for the graph.
b) Describe the transformations from the parent function $f(x) = \sqrt{x}$
c) State the domain and range of the graph.

3)



a. $y = \sqrt{x+3} - 1$
b. left 3, down 1
c. d: $[-3,\infty)$ $x \geq -3$ r: $[-1,\infty)$ $y \geq -1$

4)



a. $y = -\sqrt{x-2} - 4$
b. reflect over x axis, right 2, down 4
c. d: $[2,\infty)$ $x \geq 2$ r: $(-\infty,-4]$ $y \leq -4$

5) Solve the equation and identify any extraneous roots: $2\sqrt{\frac{x}{3}} = 4$

$\frac{2\sqrt{\frac{x}{3}}}{2} = \frac{4}{2}$
$\left(\sqrt{\frac{x}{3}}\right)^2 = (2)^2$
$\frac{x}{3} = \frac{4}{1}$
$x = 12$

6) Solve the equation in ***simplest radical*** form: $3x^2 = 2(x+2)$

$a=3$, $b=-2$, $c=-4$

$3x^2 = 2x + 4$
$3x^2 - 2x - 4 = 0$
$x = \frac{2 \pm \sqrt{(-2)^2 - 4(3)(-4)}}{2(3)} = \frac{2 \pm \sqrt{52}}{6} = \frac{2 \pm \sqrt{4 \cdot 13}}{6}$
$x = \frac{2 \pm 2\sqrt{13}}{6} = \frac{1 \pm \sqrt{13}}{3}$

7) Solve by ***completing the square***: $x^2 + 4 = 12x$

$\left(\frac{-12}{2}\right)^2$
$(-6)^2 = 36$

$-12x \quad -12x$
$x^2 - 12x + 4 = 0$
$(x^2 - 12x + 36) + 4 - 36 = 0$
$(x-6)^2 - 32 = 0$
$\sqrt{(x-6)^2} = \sqrt{32}$
$x - 6 = \pm\sqrt{16 \cdot 2}$
$+6 \quad +6$
$x = 6 \pm 4\sqrt{2}$

8) Solve the system of equations, ***algebraically***:

$y = 2x^2 - 4x + 1$ and $y = 7x - 4$

$2x^2 - 4x + 1 = 7x - 4$
$-7x + 4 \quad -7x + 4$
$2x^2 - 11x + 5 = 0$
$(2x - 10)(2x - 1) = 0$
$2(x - 5)(2x - 1) = 0$

| | |
|---|---|
| $x = 5$ | $x = \frac{1}{2}$ |
| $y = 7(5) - 4$ | $y = 7(\frac{1}{2}) - 4$ |
| $y = 31$ | $y = -\frac{1}{2}$ |

(5, 31) $(\frac{1}{2}, -\frac{1}{2})$

9) A carnival game asks participants to strike a spring with a hammer. The spring shoots a weight upward towards the bell, the participant wins a prize. Suppose that the participant strikes the spring and shoots the weight according to the model $h(t) = -16t^2 + 32t + 18$, where d is the distance in feet between the weight and the bell and t is the time in seconds since the weight was struck. If the bell is 30 feet up, find, ***algebraically***, the time the weight will hit the bell to the ***nearest tenth*** of a second.

$-16t^2 + 32t + 18 = 30$
$-30 \quad -30$
$-16t^2 + 32t - 12 = 0$
$16t^2 - 32t + 12 = 0$
$t = \frac{32 \pm \sqrt{(-32)^2 - 4(16)(12)}}{2(16)} = \frac{32 \pm \sqrt{256}}{32}$

$x = 1.5, .5$ sec.

For 10 & 11: a) Write the starting point.
b) Find the domain and range of the function:

10) $f(x) = \sqrt{x-2} - 6$

a. $(2, -6)$

b. $d: [2, \infty)$, $x \geq 2$

$r: [-6, \infty)$, $y \geq -6$

11) $f(x) = -\sqrt{x+4} + 1$

a. $(-4, 1)$

b. $d: [-4, \infty)$, $x \geq -4$

$r: (-\infty, 1]$, $y \leq 1$

For 12 & 13, find the domain, ***algebraically***, for which the radical represents a real number.

12) $f(x) = \sqrt{4-3x}$

$4 - 3x \geq 0$

$-4 \quad -4$

$-3x \geq -4$

$\frac{-3x}{-3} \geq \frac{-4}{-3}$

$x \leq \frac{4}{3}$

13) $f(x) = \sqrt{\frac{2x-9}{9}}$

$\frac{2x-9}{9} \geq \frac{0}{1}$

$2x - 9 \geq 0$

$+9 \quad +9$

$\frac{2x}{2} \geq \frac{9}{2}$

$x \geq \frac{9}{2}$

Solve the equation and identify any extraneous roots:

14) $6 - 3\sqrt{x} = 12$

$-6 \quad -6$

$\frac{-3\sqrt{x}}{-3} = \frac{6}{-3}$

$(\sqrt{x})^2 = (-2)^2$

$x = 4$

15) $\sqrt{5x-9} + 1 = x$

$-1 \quad -1$

$(\sqrt{5x-9})^2 = (x-1)^2$

$5x - 9 = (x-1)(x-1)$

$5x - 9 = x^2 - 1x - 1x + 1$

$5x - 9 = x^2 - 2x + 1$

$-5x + 9 \quad -5x + 9$

$0 = x^2 - 7x + 10$

$0 = (x-5)(x-2)$

$x = 5 \quad | \quad x = 2$

16) Solve by ***completing the square***: $x^2 = 8x + 24$

$-8x - 24 \quad -8x - 24$

$x^2 - 8x - 24 = 0$

$\left(\frac{-8}{2}\right)^2 = (-4)^2 = 16$

$(x^2 - 8x + 16) - 24 - 16 = 0$

$(x-4)^2 - 40 = 0$

$+40 \quad +40$

$\sqrt{(x-4)^2} = \sqrt{40}$

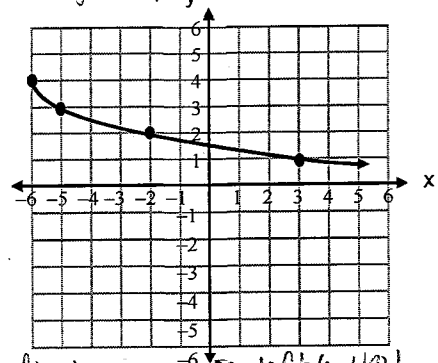
$x - 4 = \pm\sqrt{4 \cdot 10}$

$+4 \quad +4$

$x = 4 \pm 2\sqrt{10}$

For 17 & 18: a) Write the equation for the graph.
b) Describe the transformations from the parent function $f(x) = \sqrt{x}$
c) State the domain and range of the graph.

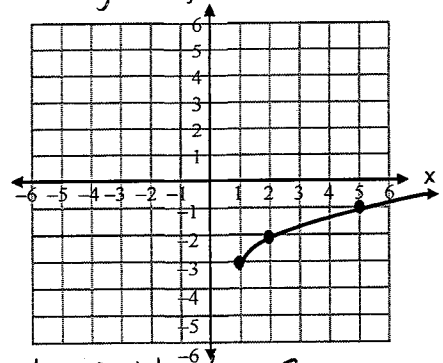
17) a. $y = -\sqrt{x+6} + 4$



b. reflect over x axis, left 6, up 4

c. $d: [-6, \infty)$, $x \geq -6$ $r: (-\infty, 4]$, $y \leq 4$

18) a. $y = \sqrt{x-1} - 3$



b. right 1, down 3

c. $d: [1, \infty)$, $x \geq 1$ $r: [-3, \infty)$, $y \geq -3$

Solve the equation in ***simplest radical*** form:

19) $(2x + 3)(x + 4) = 1$

$2x^2 + 8x + 3x + 12 = 1$

$-1 \quad -1$

$2x^2 + 11x + 11 = 0$

$x = \frac{-11 \pm \sqrt{(11)^2 - 4(2)(11)}}{2(2)} = \frac{-11 \pm \sqrt{33}}{4}$

20) $\frac{x-2}{x+2} = \frac{1}{x-3}$

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

$x^2 - 3x - 2x + 6 = x + 2$

$x^2 - 5x + 6 = x + 2$

$-x \quad -2 \quad -x \quad -2$

$x^2 - 6x + 4 = 0$

$x = \frac{6 \pm \sqrt{(-6)^2 - 4(1)(4)}}{2(1)}$

$x = \frac{6 \pm \sqrt{20}}{2} = \frac{6 \pm \sqrt{4.5}}{2} = \frac{6 \pm 2\sqrt{5}}{2} = 3 \pm \sqrt{5}$

21) Solve the system of equations, ***algebraically***, to the ***nearest hundredth***:

$-x^2 + 4 = x + 3$

$+x^2 - 4 \quad +x^2 - 4$

$0 = x^2 + x - 1$

$y = -x^2 + 4$ and $y = x + 3$

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

$x = \frac{-1 \pm \sqrt{5}}{2}$

$x = .62 \rightarrow y = .62 + 3 = 3.62$

$x = -1.62 \rightarrow y = -1.62 + 3 = 1.38$

$(.62, 3.62)$

$(-1.62, 1.38)$

22) A juggler throws a ball into the air from a height of 5 feet with an initial vertical velocity of 16 feet/sec. The path of the ball can be modeled by $h(t) = -16t^2 + 60t + 5$. Find ***algebraically*** how long does the juggler have to catch the ball before it hits the ground, to the ***nearest tenth*** of a second?

$-16x^2 + 60x + 5 = 0$

$16x^2 - 60x - 5 = 0$

$x = \frac{60 \pm \sqrt{(-60)^2 - 4(16)(-5)}}{2(16)}$

$x = \frac{60 \pm \sqrt{3920}}{32} = 3.83$ sec.