Spiral Review:

1. Solve by factoring.

$$3x^2 + 10x - 8 = 0$$

$(3x-2)(x+4)=0$

$\boxed{x=\frac{2}{3}}$ $\boxed{x=-4}$

2. Solve.

$$|x+9| - 7 = 10$$

$+7 \quad +7$

$|x+9|=17$

$(+)$ $x+9=17$ $\boxed{x=8}$ ✓

$(-)$ $x+9=-17$ $\boxed{x=-26}$ ✓

3. Solve.

$$(x-3)^{\frac{2}{3}} = 4$$

$\left(\sqrt[3]{(x-3)^2}\right)^3=(4)^3$

$\sqrt{(x-3)^2}=\sqrt{64}$

$x-3=\pm 8$

$x-3=8$ $\boxed{x=11}$ ✓ $x-3=-8$ $\boxed{x=-5}$ ✓

4. Solve using Quadratic Formula.

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

$x=\frac{1\pm\sqrt{(-1)^2-4(2)(-5)}}{2(2)}$

$=\boxed{\frac{1\pm\sqrt{41}}{4}}$

p.41 1.4 Shifting, Reflecting, and Stretching Graphs

Review: Graph the function, find the domain and range.

1. $f(x) = 3$

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

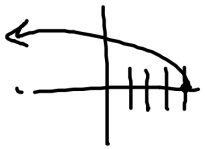
R: $y=3$

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

$4-x=0$
$-x=-4$
$x=4$

D: $(-\infty, 4]$

R: $[0, \infty)$



Example 1: Use the graph to sketch the graph of f.

a.) y = f(x) - 1 (same, subtract 1)

(-2,3) (0,2) (1,-1) (3,-2)

b.) y = f(x + 2) (subtract 2, same)

(-4,4) (-2,3) (-1,0) (1,-1)

c.) y = f(x - 1) (add 1, same)

(-1,4) (1,3) (2,0) (4,-1)

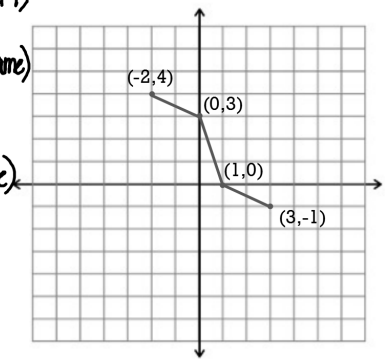
d.) y = -f(x - 2) (add 2, same)

(same, mult. -1)

(0,-4) (2,-3) (3,0) (5,1)

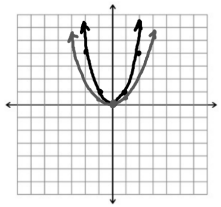
e.) y = f(2x) (mult. $\frac{1}{2}$, same)

$(-1,4)$ $(0,3)$ $(\frac{1}{2},0)$ $(\frac{3}{2},-1)$



Example 2: Compare the function with its parent function.

a.) $y = \frac{1}{3}x^2$



Parent Function:

$y = x^2$

What's happening?

vertical shrink

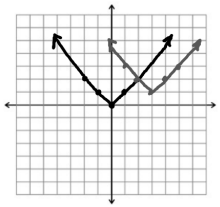
$y_1 = x^2$

$y_2 = \frac{1}{3}x^2$

* if "a" is a fraction → vertical shrink

* if "a" is a whole # → vertical stretch

b.) $y = |x - 3| + 1$



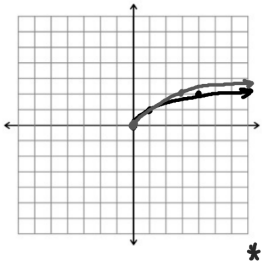
Parent Function:

$y = |x|$

What's happening?

right 3, up 1

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



Parent Function:

$y=\sqrt{x}$

What's happening?

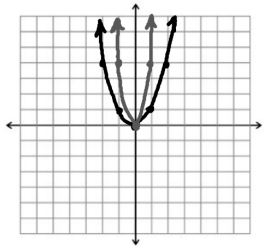
horizontal shrink

$f(a \cdot x)$

* if "a" is a fraction
→ horizontal stretch

* if "a" is a whole #
→ horizontal shrink

d.) $f(x) = 4x^2$



Parent Function:

$y=x^2$

What's happening?

vertical stretch

Example 3: (a) Identify the parent graph (b) Describe the transformations.

a.) $g(x) = (x-10)^2 + 5$

Parent function:

$y=x^2$

Transformations:

right 10, up 5

b.) $g(x) = -\frac{1}{4}(x+2)^2 - 2$

Parent function:

$y=x^2$

Transformations:

reflected over x-axis, vertical shrink, left 2, down 2

c.) $g(x) = -3\sqrt{x+1} - 6$

Parent function:

$y=\sqrt{x}$

Transformations:

reflected over x-axis (−)
vertical stretch (3)
left 1
down 6

d.) $g(x) = \frac{1}{x-7} + 4$

Parent function:

$y=\frac{1}{x}$

Transformations:

right 7, up 4

Turn-in Problems:

p. 47 (2, 28, 44, 56)

HW Problems:

p.47 (19, 23-45, 51-63, 83-85 odds)

a and b
only