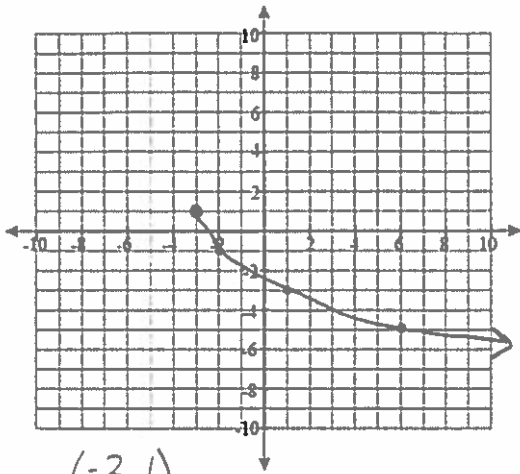


Review Square Roots

Name: Answer Key

Graph and determine the attributes of the following functions.

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



Vertex: $(-3, 1)$

Increasing: Never Decreasing: $(-3, \infty)$

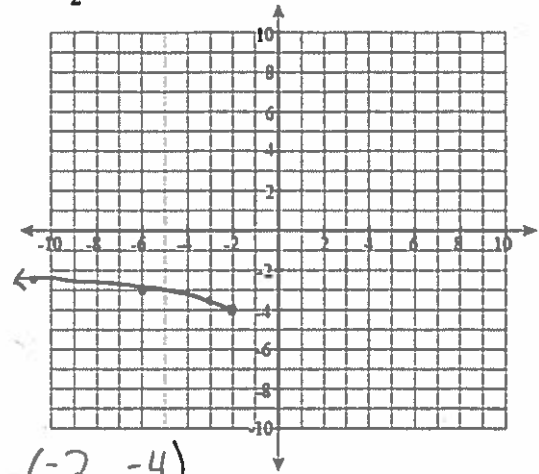
Domain: $[-3, \infty)$ Range: $(-\infty, 1]$

x-intercept: $(-2.75, 0)$ y-intercept: $(0, -2\sqrt{3}+1)$

End behavior: As $x \rightarrow \infty, f(x) \rightarrow -\infty$

Transformation(s): vert reflection, vert stretch by 2, shift left 3 and up 1

2) $g(x) = \frac{1}{2}\sqrt{-(x+2)} - 4$



Vertex: $(-2, -4)$

Increasing: Never Decreasing: $(-\infty, -2)$

Domain: $(-\infty, -2]$ Range: $[-4, \infty)$

x-intercept: $(-6, 0)$ y-intercept: None

End behavior: As $x \rightarrow -\infty, f(x) \rightarrow \infty$

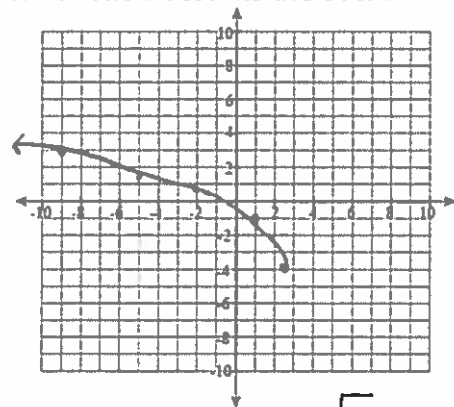
Transformation(s): vert. comp. by 1/2, shift left 2 and down 4, hor. reflection

3) The following points represent a square root relationship. Which function best fits the data?

$(2.5, -4), (1, -1), (-2, .75), (-5, 1.25), (-9, 3)$

(A) $f(x) = -\sqrt{x-3} - 4$ (B) $g(x) = \sqrt{-(x-2.5)} - 2$

(C) $h(x) = 2\sqrt{x+4} - 3$ (D) $k(x) = 2\sqrt{-(x-3)} - 4$



4) Solve the equation $x = 2\sqrt{4y-b}$ for y.

$$\frac{1}{2}x = \sqrt{4y-b}$$

$$\left(\frac{1}{2}x\right)^2 = 4y-b$$

$$\left(\frac{1}{2}x\right)^2 + b = 4y$$

$$\boxed{\frac{\left(\frac{1}{2}x\right)^2 + b}{4} = y}$$

5) Solve the equation $y - c = \sqrt{\frac{\pi r}{3}}$ for r.

$$(y-c)^2 = \frac{\pi r}{3}$$

$$3(y-c)^2 = \pi r$$

$$\boxed{\frac{3(y-c)^2}{\pi} = r}$$

Solve the following square root equations. Identify any extraneous solutions.

6) $x + 3 = \sqrt{x + 5}$

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

$$x^2 + 6x + 9 = x + 5$$

$$x^2 + 5x + 4 = 0$$

$$(x+4)(x+1) = 0$$

$$x+4 = 0 \quad x+1 = 0$$

$$x = -4 \quad \boxed{x = -1}$$

Extraneous

$$-4 + 3 \neq \sqrt{-4 + 5}$$

7) $4\sqrt{7x-1} = \sqrt{5x+3}$

$$(4\sqrt{7x-1})^2 = (\sqrt{5x+3})^2$$

$$16(7x-1) = 5x+3$$

$$112x - 16 = 5x + 3$$

$$107x - 16 = 3$$

$$107x = 19$$

$$\boxed{x = \frac{19}{107}}$$

Evaluate each of the following square root expressions.

8) Find $f(2)$ given $f(x) = -2\sqrt{10x-4} + 2$

$$f(2) = -2\sqrt{10(2)-4} + 2$$

$$f(2) = -2\sqrt{16} + 2$$

$$f(2) = -2(4) + 2$$

$$\boxed{f(2) = -6}$$

9) Find $g(x) = 3$ given $g(x) = \frac{\sqrt{4x+2}}{2} + 1$

$$3 = \frac{\sqrt{4x+2}}{2} + 1$$

$$16 = 4x + 2$$

$$2 = \frac{\sqrt{4x+2}}{2}$$

$$14 = 4x$$

$$4 = \sqrt{4x+2}$$

$$\boxed{x = 3.5}$$

10) Find $h(2x+1)$ given $h(x) = 3\sqrt{4x-1} + 23$

$$h(2x+1) = 3\sqrt{4(2x+1)-1} + 23$$

$$h(2x+1) = 3\sqrt{8x+4-1} + 23$$

$$\boxed{h(2x+1) = 3\sqrt{8x+3} + 23}$$

11) The data represents the radar-detected speed, s , in inches per second, of a dropped object at the end of a fall as a function of its starting height, v , in inches.

The equation $s(v) = 22.26\sqrt{v-30} + 56$ represents the data.

(a) Estimate the speed if the starting height was 63 inches.

$$s = 22.26\sqrt{63-30} + 56 \rightarrow s = 22.26\sqrt{33} + 56 \rightarrow \boxed{s = 183.874}$$

(b) Estimate the starting height if the speed at the sensor was 400 in/sec.

$$400 = 22.26\sqrt{v-30} + 56 \rightarrow 15.454 = \sqrt{v-30} \rightarrow \boxed{v = 268.818}$$

$$344 = 22.26\sqrt{v-30} \rightarrow 238.818 = v-30$$

Starting Height (v) (Inches)	Speed at Sensor (s) (in./sec)
30	56
35	101
45	129
70	193
90	226
125	273
150	313
200	354