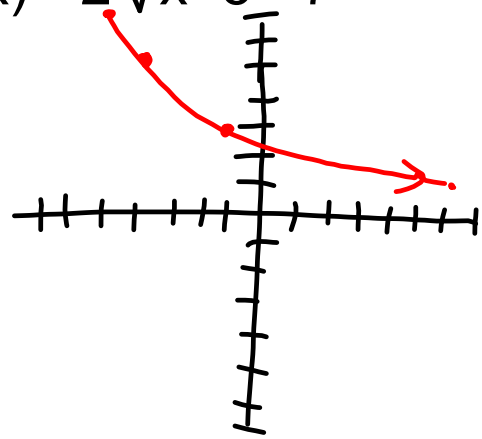
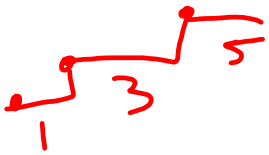
Bellwork: Graph the following function:

$f(x)=-2\sqrt{x+5}+7$

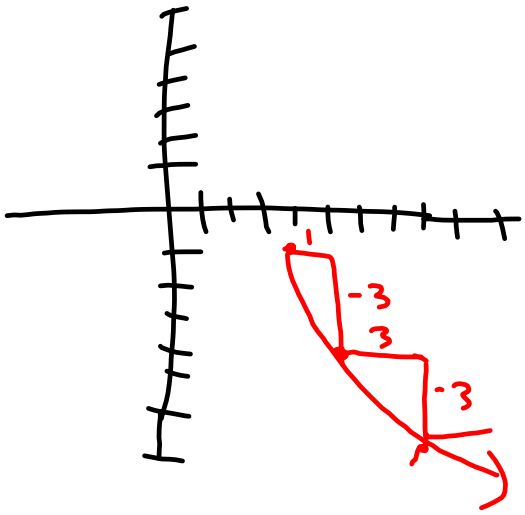


s.p. $(-5,7)$

$a=-2$



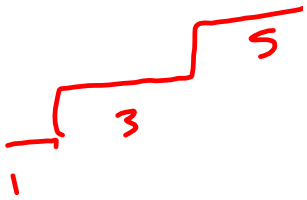
6)



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

s.p. $(4,-1)$

$a=-3$



Today's Objectives:

Review for the Unit 3 Test

Don't forget to make your 3"x5" notecard!

1) $-6 = -3\sqrt{3a-2}$

$\frac{-6}{-3} = \frac{-3\sqrt{3a-2}}{-3}$

$2 = \sqrt{3a-2}$ ²

$4 = 3a - 2$

$+2 \quad +2$

$\frac{6}{3} = \frac{3a}{3}$

$a = 2$ CHECK:

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

$-6 = -3\sqrt{4}$

$-6 = -3(2)$ ✓

3) $-3\sqrt{\frac{n}{10}} = -21$

$\frac{-3\sqrt{\frac{n}{10}}}{-3} = \frac{-21}{-3}$

$\sqrt{\frac{n}{10}} = 7$ ²

$\frac{n}{10} = 49 \cdot 10$

$n = 490$

CHECK:

$-3\sqrt{\frac{490}{10}} = -21$

$-3\sqrt{49} = -3(7) = -21$ ✓

5) $\cancel{\sqrt{-5-2n}}^{2} = \cancel{\sqrt{1-n}}^{2}$

$-5-2n = 1-n$

$-1 \quad +2n \quad +1 \quad +2n$

$\boxed{-6 = n}$

CHECK:

$\sqrt{-5-2(-6)} = \sqrt{1-(-6)} \rightarrow \sqrt{-5+12} = \sqrt{7} \checkmark = \sqrt{7}$

7) $\cancel{\sqrt{-8+6x}}^{2} = x^{2}$

$-8+6x = x^2+8-6x$

$+8 \quad -6x$

$0 = x^2-6x+8$

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

$\boxed{x = 2, 4}$

8

-2 -4

-6

CHECK: $\sqrt{-8+6(2)} = 2$

$\sqrt{-8+12}$

$\sqrt{4} = 2 \checkmark$

$\sqrt{-8+6(4)}$

$\sqrt{16} = 4$

$\checkmark$

9) $\sqrt{100} = a$

$a = 10$

11) $(\cancel{\sqrt{4p+8}})^{2} = (p+3)^{2}$

$4p+8 = p^2+6p+9$

$-4p \quad -8 \quad -4p \quad -8$

$0 = p^2+2p+1$

1

1 1

2

$0 = (p+1)(p+1)$

$p = -1$

CHECK $\sqrt{4(-1)+8} = -1+3 \checkmark$

$\sqrt{-4+8} = \sqrt{4} = 2$

13) $\left(\sqrt{6r-21}\right)^2 = (r-2)^2$

$\cancel{6r} - \cancel{21} = r^2 - 4r + 4$

$\cancel{-6r} \cancel{+21} \quad -6r + 21$

$0 = r^2 - 10r + 25$

$0 = (r-5)(r-5)$

$r = 5$

CHECK:

$\sqrt{6(5)-21} = 5-2$

$\sqrt{9} \overset{\checkmark}{=} 3$

Solve each equation.

15) $\dfrac{|8-5k|}{\cancel{2}} = 2 \quad \cdot 2$

$|8-5k| = 4$

$8 - 5k = 4$

$-8 \qquad -8$

$\dfrac{-5k}{-5} = \dfrac{-4}{-5}$

$8 - 5k = -4$

$-8 \qquad -8$

$\dfrac{-5k}{-5} = \dfrac{-12}{-5}$

$\boxed{k = \dfrac{4}{5}, \dfrac{12}{5}}$

17) $-4|7b+4| = -100$

19) $-5|x+7| = 15$

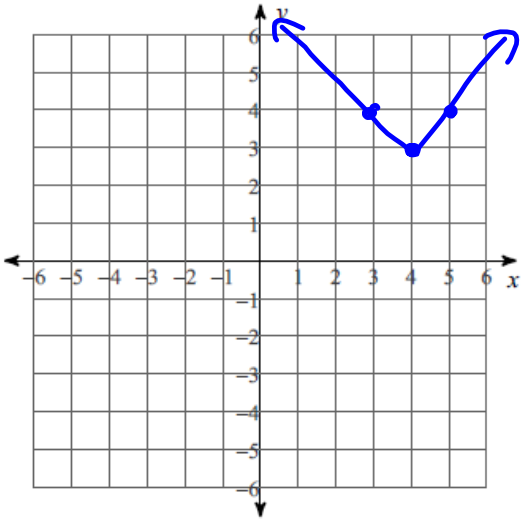
$-5 \qquad -5$

$|x+7| = -3$

No solution

Graph each equation.

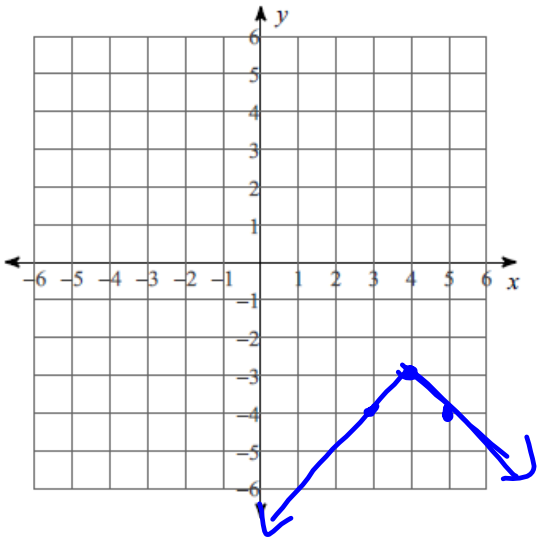
21) $y = 1|x - 4| + 3$



vertex: (4, 3)

$a = 1$

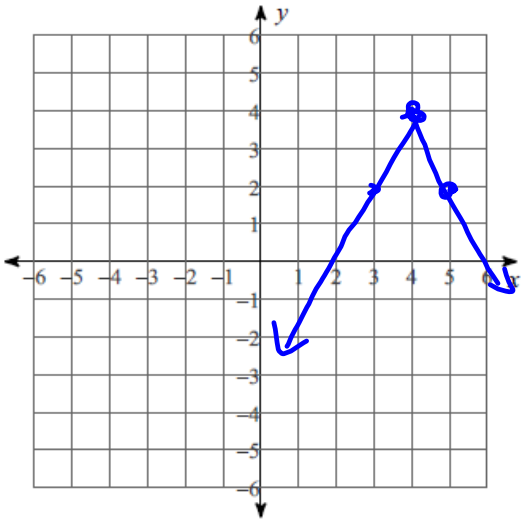
23) $y = -|x - 4| - 3$



vertex: (4, −3)

$a = -1$

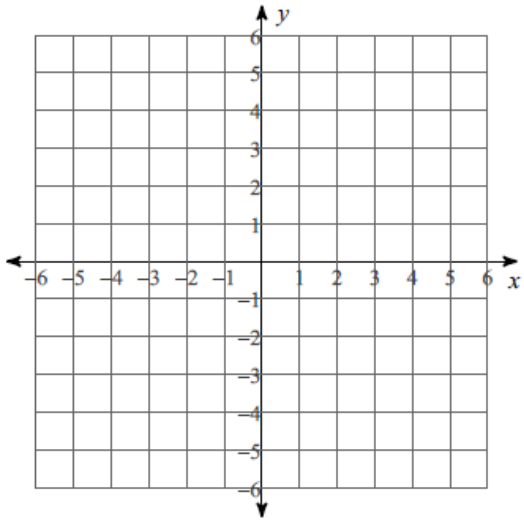
25) $y = -2|x - 4| + 4$



vertex: (4,4)

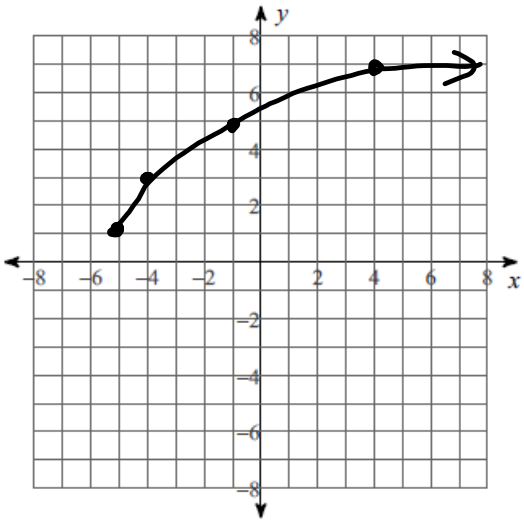
$a = -2$

27) $y = 3|x + 1| + 1$



Sketch the graph.

29) $y = 2\sqrt{x+5} + 1$



s.p. $(-5, 1)$

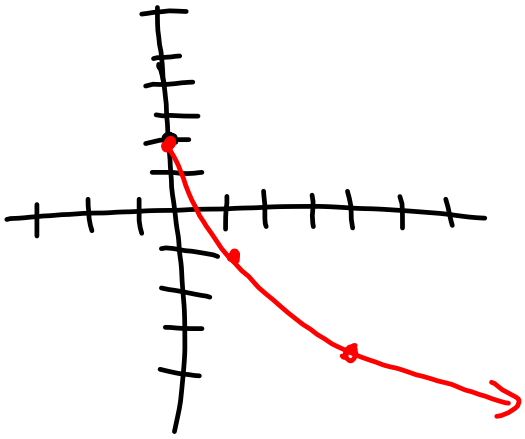
$a = 2$

30) $2 - 3\sqrt{x}$

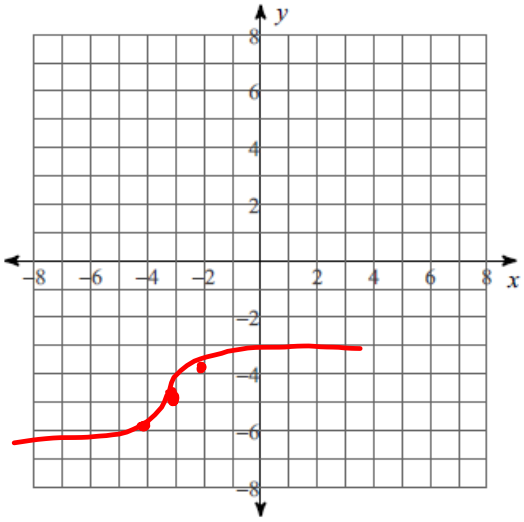
$-3\sqrt{x} + 2$

s.p.: $(0, 2)$

$a = -3$



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



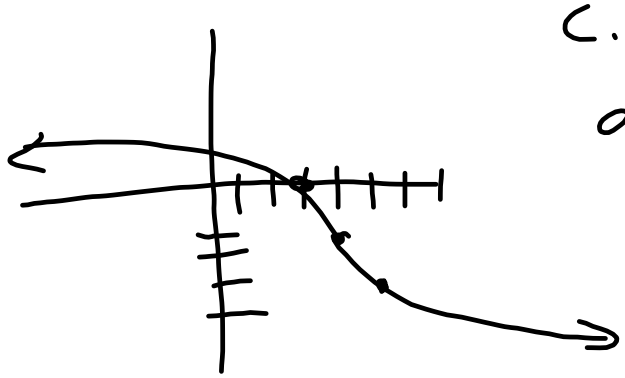
c.p. $(-3,-5)$

$a = 1$

32) $-2\sqrt[3]{x-4} - 2$

c.p $(4,-2)$

$a = -2$



33) One way to measure the amount of energy that a moving object (such as a car) possesses is by finding its Kinetic Energy. The Kinetic Energy (Ek, measured in Joules) of an object depends on the object's mass (m, measured in kg) and velocity (v, measured in meters per second), and can be written as . $v = \sqrt{\frac{2Ek}{m}}$

What is the Kinetic Energy of an object with a mass of 1,500 kilograms that is traveling at 18 meters per second?

$18^2 = \sqrt{\frac{2Ek}{1500}}$

$1500 \cdot 324 = \frac{2Ek}{1500} \cdot 1500$

$\frac{486{,}000}{2} = \frac{2Ek}{2}$

$243{,}000 = Ek$

$\boxed{2.43 \times 10^5 J}$

34) In a thunderstorm, the wind velocity in meters per second can be described by the function $v(p) = 5.7\sqrt{998 - p}$ where p is the air pressure in millibars. What is the air pressure in a thunderstorm in which the air velocity is 53 meters per second. Round to the nearest millibar.

$\frac{53}{5.7} = \frac{5.7\sqrt{998-p}}{5.7}$

$9.298^2 = \sqrt{998-p}^2$

$86.457 = 998 - p$

$-998 \quad -998$

$-911.542 = -p$

$\boxed{p = 912 \text{ millibar}}$

35) The water temperature for a pet turtle should be about 80 degrees farenheit, give or take 5 degrees (represented by $|80 - x| = 5$). What is the maximum and minimum temperatures for the water?

$$\cancel{80} - x = 5$$
$$-\cancel{80} \qquad -80$$

$$\cancel{80} - x = -5$$
$$-\cancel{80} \qquad -80$$

$$\frac{-x}{-1} = \frac{-75}{-1}$$

$$\frac{-x}{-1} = \frac{-85}{-1}$$

$$\boxed{x = 75^\circ, 85^\circ}$$