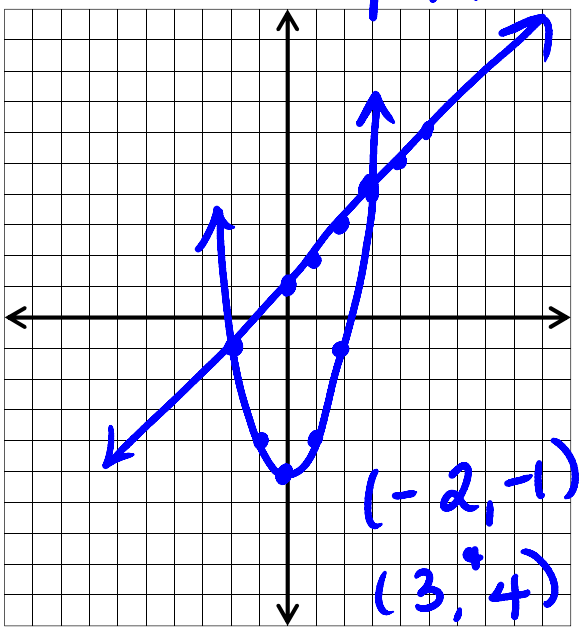
Algebra 2 Trig H **Name:**

Systems Day 2

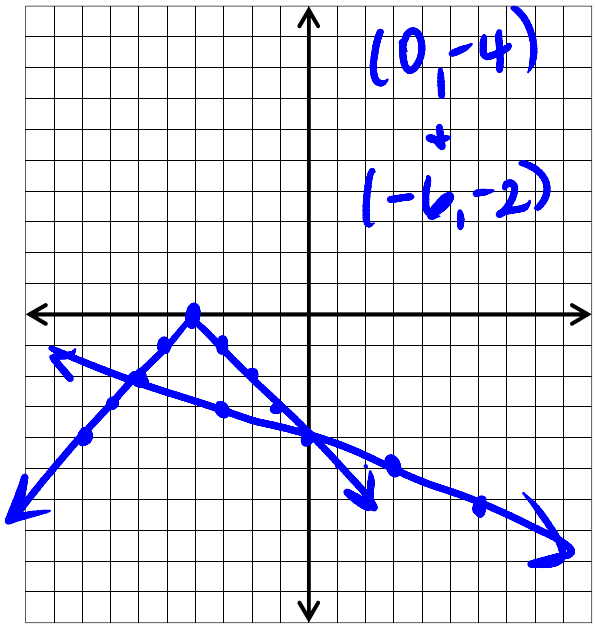
Round values to the nearest hundredth if necessary.

1. NON-CALC: Solve each system of equations by graphing on the coordinate plane below.

a. $\begin{cases} y = x^2 - 5 \\ 8y - 8x = 8 \end{cases}$



b. $\begin{cases} y = -|x+4| \\ y = -\frac{1}{3}x - 4 \end{cases}$



2. Solve the following systems using the "calculate the intersection" function on your calculator. You may approximate your solution to the nearest hundredth if necessary.

a. $\begin{cases} y = x^3 - 4 \\ y = 3x - 4 \end{cases}$

Solution: (-1.73, -9.20) (0, -4) (1.73, 1.20)

b. $\begin{cases} y = -(x-2) \\ y = 6\sqrt{x-1} - 2 \end{cases}$

Solution: (1.22, 0.78)

c. $\begin{cases} y = 3x^2 - 5x - 1 \\ 4y = 3x - 20 \end{cases}$

Solution: NO SOL.

d. $\begin{cases} y = 3 \cdot 3^{x-1} \\ y = 3^x \end{cases}$ **Hint:Press ENTER in front of Y_2**

Solution: infinitely many solutions along $y = 3^x$

3. Use INTERSECT to solve the following equations on your calculator. Enter one side of the equation as Y_1 and the other side as Y_2. You may approximate your solutions to the nearest hundredth.

a. $|2x-7|=3x+4$ b. $3x^2-5x+2=-2x^2+4x+3$ c. $5^{3x-10}-4=0.2\cdot 17^{3-x}$

$x=0.6$ $x=-0.10, 3.36$ $x=3.62$

4. Earl throws a water balloon from his balcony at a rate of 20 feet/sec. The formula $y=-16x^2-20x+70$ gives the height of the balloon in feet after x seconds of free fall.
   a. Find the height of the balloon after 0.5 seconds.

$y=56$ feet

   b. Find how long it will take the balloon to hit the ground.

$0=-16x^2-20x+70$

$x=1.55$ sec

5. An excursion boat takes 1.5 times as long to go 360 miles up a river as to return. If the boat cruises at 15 miles per hour in still water, what is the rate of the current? Use your calculator to solve.

$d=r\cdot t$ so $t=\frac{d}{r}$ AND time up $=1.5\cdot$ time down

$\frac{360}{15-x}=1.5\cdot\frac{360}{15+x}$ $x=3$ mi/hour

6. An old computer can do the weekly payroll in 5 hours. A newer computer can do the same payroll in 3 hours. The old computer starts on the payroll, and after 1 hour the newer computer is brought online to work with the older computer until the job is finished. How long will it take both computers working together to finish the job?

$\frac{1}{5}x+\frac{1}{3}(x-1)=1$ $x=2.5$ hours