

Algebra 2 Trig H
Systems Day 2 homework

Name: **KEY**

Solve the following systems algebraically.

1. $f(x) = 2x^2 - 7 - 3x$
 $g(x) = -4 - 4x$



$$2x^2 - 3x - 7 = -4 - 4x$$

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

$$(2x + 3)(x - 1)$$

$$x = -\frac{3}{2} \quad x = 1$$

So $y = -4 - 4(-\frac{3}{2})$ $y = -4 - 4(1)$

$$y = 2$$

$$y = -8$$

$$\boxed{(-\frac{3}{2}, 2)}$$

$$\boxed{(1, -8)}$$

2. $(x + 1)^2 + y^2 = 100$
 $2x - y = 2$

$$-y = -2x + 2$$

$$y = 2x - 2$$

$$(x + 1)^2 + (2x - 2)^2 = 100$$

$$x^2 + 2x + 1 + 4x^2 - 8x + 4 = 100$$

$$5x^2 - 6x + 5 = 100$$

$$5x^2 - 6x - 95 = 100$$

$$(5x + 19)(x - 5) = 0$$

$$x = -\frac{19}{5}$$

$$x = 5$$

so $y = 8$

$$y = -\frac{48}{5}$$

$$\boxed{(5, 8)}$$

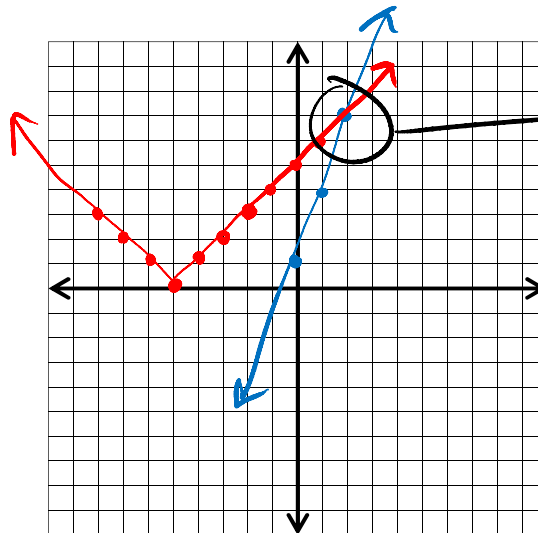
$$\boxed{(-\frac{19}{5}, -\frac{48}{5})}$$

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

a. $\begin{cases} y = |x + 5| \\ -6x + 2y = 2 \end{cases}$

$$2y = 6x + 2$$

$$y = 3x + 1$$



$(1, 7)$ - Solution

4. 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. $\begin{cases} 3x + y = 2x^2 - 7 \\ y = \frac{14}{3}x - 5 \end{cases}$

b. $\begin{cases} y = -x^2 + 3 \\ y = \sqrt{-2x - 4} \end{cases}$

Solution: $(-0.25, -6.14)$
 $(4.08, 14.03)$

Solution(s): **NO solution**

c. $\begin{cases} y = x^2 - 5x - 1 \\ -4y = x^2 - 72 \end{cases}$ $y = -\frac{x^2}{4} + 18$

Solution: $\begin{pmatrix} -2.38, 16.58 \\ 6.38, 7.82 \end{pmatrix}$

d. $\begin{cases} y = -2^{x+5} \\ y = |x-3| + 4 \end{cases}$

Solution: No Solution

5. Use INTERSECT to solve the following equations on your calculator.

a. $3x^2 - 5x + 2 = -2x^2 + 4x + 3$

$x = -.10 \text{ or } 3.36$

b. $-.5(x-6)^2 + 15 = |2x-3| + 10$

No Solution

Create an equation and use the graphing calculator to solve the problem.

6. An excursion boat takes 1.3 times as long to go 400 miles up a river as to return. If the boat cruises at 22 miles per hour in still water, what is the rate of the current? Use your calculator to solve.

up	rate $22-x$	time $1.3y$	dist 400	$(22-x)1.3y = 400$ $y = \frac{400}{1.3(22-x)}$
down	$22+x$	y	400	$(22+x)y = 400$ $y = \frac{400}{22+x}$

2.87 mph

7. The path of a football thrown across a field is given by the equation $y = -0.005x^2 + x + 5$, where x represents the distance, in feet, the ball has traveled horizontally and y represents the height in feet of the ball above ground level. About how far has the ball traveled horizontally when it is 32 feet high?

$y = -.005x^2 + x + 5$
 $y = 32$

$x = 32.18 \text{ feet and } 167.82 \text{ feet}$