1 HW Help

2 WARM UP

pick up

1 Solve for n

$2m-(3+n)=100m$

$-2m \qquad -2m$

$-(3+n)=98m$

$-3-n=98m$

$+3 \qquad +3$

$-n=98m+3$

So $n=-98m-3$

(2) $\frac{1}{3}|10-x| = 5+x$

multiply all three terms by 3

$|10-x| = 15+3x$

inside = right side  inside = opp of right side

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$|10-x| = 15+3x$

inside = right side  inside = opp of right side

$10-x = 15+3x$
$+x \quad +x$

$10 = 15+4x$
$-15 \quad -15$

$-5 = 4x$

$x = -\frac{5}{4}$

$10-x = -(15+3x)$

$10-x = -15-3x$
$+3x \quad +3x$

$10+2x = -15$
$-10 \quad -10$

$2x = -25$

$x = -\frac{25}{2}$

③ Solve the inequality directly

$$\frac{2|x-5|}{2} \geq \frac{13}{2}$$

$$|x-5| \geq 6.5$$

inside $\geq 6.5$

$x-5 \geq 6.5$

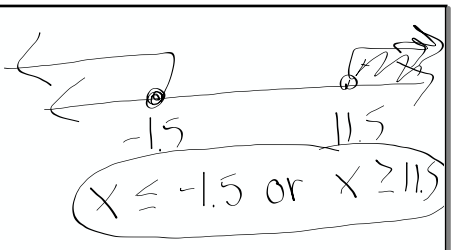
$x \geq 11.5$

inside $\leq -6.5$

$x-5 \leq -6.5$

$+5 \quad +5$

$x \leq -1.5$

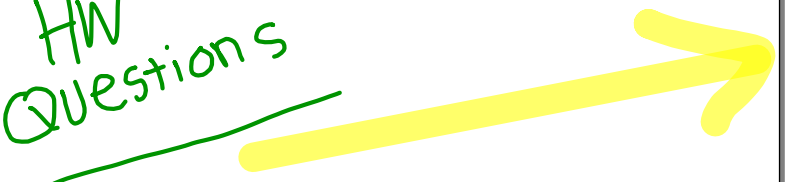


④ $4m^5 \cdot 3m^{-7} = \frac{12}{m^2}$

⑤ $\frac{x^2}{w^{-7}} \cdot \frac{x^3w^2}{x} = x^4w^9$

⑥ $\left(\frac{m^5n^{-3}}{y}\right)^{-2} = \frac{y^2n^6}{m^{10}}$

HW Questions

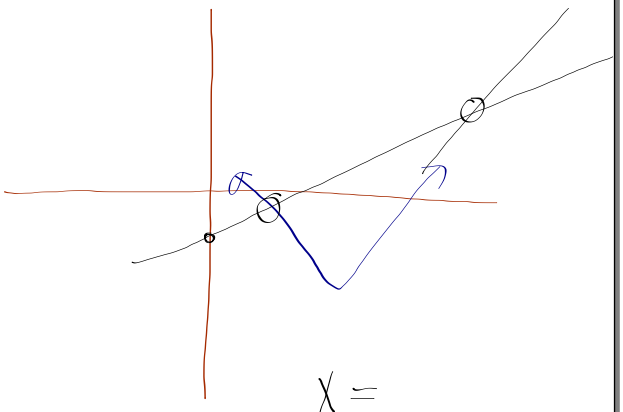


**4-22.** Solve $(x-3)^2 - 2 = x + 1$ graphically

**4-23.** Graph a system of equations to solve $2|x-4|-3=\frac{2}{3}x-3$.

$y=2|x-4|-3$

$y=\frac{2}{3}x-3$



$y=|x|$

$x=$

$x=$

**4-24.** Solve each of the following equations using any method.

a. $-3\sqrt{2x-5}+7=-8$

b. $2|3x+4|-10=12$

**4-27.** Solve the following equations. Be sure to check your answers for any extraneous solutions.

a. $\sqrt{2x-1}-x=-8$

$+x \quad +x$

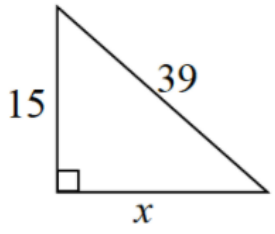
$\left(\sqrt{2x-1}\right)^2=(x-8)^2$

$2x-1=(x-8)(x-8)$

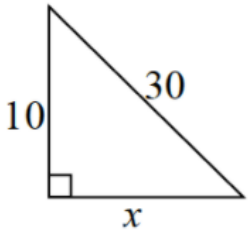
b. $\sqrt{2x-1}-x=0$

**4-28.** Find the value of $x$.

a.




b.



Use the solutions to check your answers carefully.

- You have 5 minutes.

-Use a pen, record your scores

AIM today:

- Determine the meaning of the solutions of systems ( as they relate to their graphs )
- Find solutions to complex systems

- What do solutions to Systems look like?

What do solutions look like?

$\frac{2}{x} = 5\sqrt{x+5} - 6$

Not a system

$x =$

$x =$

$x + 2y = 7$

$3x - y^2 = 18$

A complex system

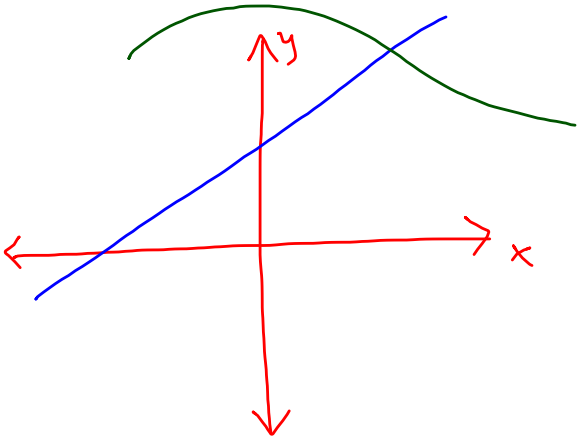
$x =$ ( , )

$y =$

The solution of a system of equations will be a pair of values

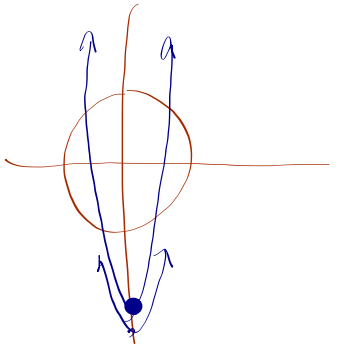
$x+2y=7$

$3x-y^2=18$



$x^2+y^2=25$

$y=x^2-13$



You will be given 4 systems. (a,b,c,d)

Follow the instructions on the **hand out**

**INSTRUCTIONS: Solve each of the four SYSTEMS of the equations the following way.**

**1.** Solve algebraically first.

**2.** Then graph the system (*and make a quick sketch*)

**3. Explain what the meaning of the algebraic solution tells you about the graph.**

You can do the work on the hand out or in your own notes. This work will be a good resource for tonight's assignment and upcoming work.

error on #B

**b** $y = \frac{1}{2}x^2 + 1$

$y = 2x - 1$

2nd equation should look like this

After each question

What did the solution tell us about the graph?

**a** $y = -3x + 5$
$y = -3x - 1$

$-3x - 1 = -3x + 5$

$-1 = 5$

false statement

∴ NO SOLUTION TO the system

(a) $y = -3x+5$

$y = -3x-1$

$-3x+5 = -3x-1$

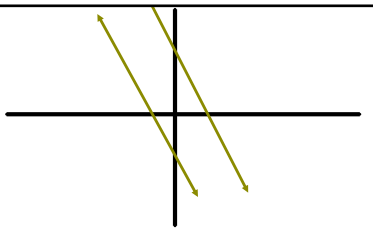
$5 = -1$

a false statement which means....

NO SOLUTIONS

(a) $y = -3x+5$

$y = -3x-1$



$-3x+5 = -3x-1$

$5 = -1$

a false statement which means....

NO SOLUTIONS

(a) $y = -3x + 5$

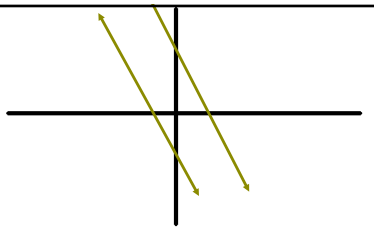
$y = -3x - 1$

$-3x + 5 = -3x - 1$

$5 = -1$

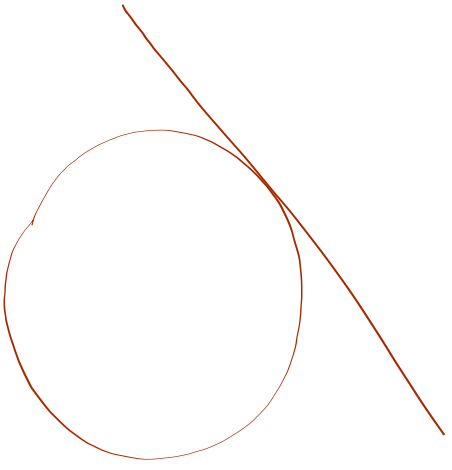
a false statement which means....

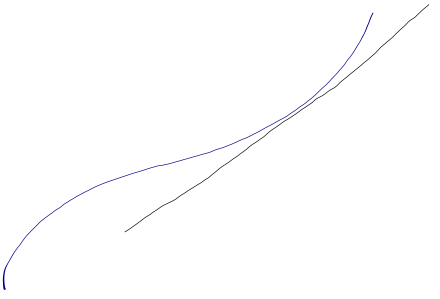
NO SOLUTIONS



What did the solution tell us ?

No solutions indicate that the two do not intersect.





**b** $y = \frac{1}{2}x^2 + 1$

$y = 2x - 1$

$4x$

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

$y = 2x - 1$

$\frac{1}{2}x^2 + 1 = 2x - 1$

$\frac{1}{2}x^2 = 2x - 2$ ← clear fractions

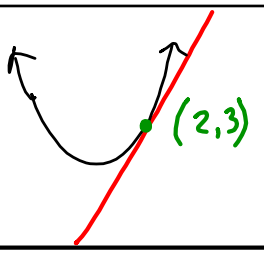
$x^2 = 4x - 4$

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

$x = 2$ → x=2 y=3

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

$y = 2x - 1$




$\frac{1}{2}x^2 + 1 = 2x - 1$

$\frac{1}{2}x^2 = 2x - 2$

$x^2 = 4x - 4$

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

$x = 2 \rightarrow$ $x=2$, $y=3$

What did the solution tell us?

The line is tangent to the parabola.

(c) $y^2 = x$

$y = x - 2$

Try something

Can ask for a hint in a bit

(c) $y^2 = x$

$y = x - 2$

$\sqrt{y^2} = \sqrt{x}$

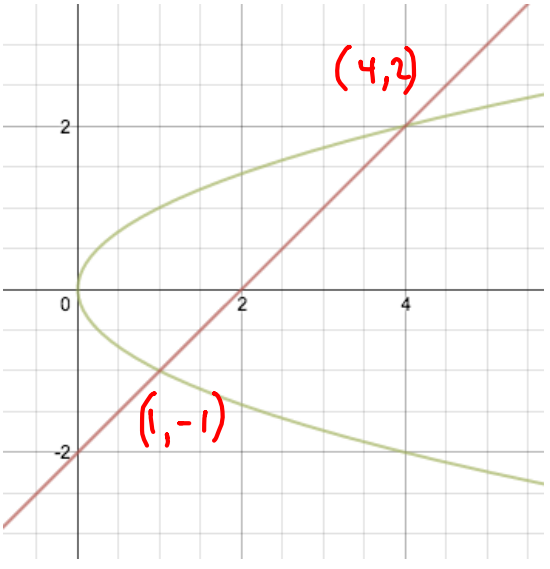
$y = \pm\sqrt{x}$ (4, 2) (1, -1)

$y = y^2 - 2$

$0 = y^2 - y - 2$

$0 = (y + 1)(y - 2)$

$y = 2 \quad y = -1$ ✓




A line intersects a sideways (sleepy) parabola at two different points

**d** $4x - 2y = 10$

$y = 2x - 5$

(d) $4x - 2y = 10$

$y = 2x - 5$

$4x - 2(2x - 5) = 10$

$4x - 4x + 10 = 10$

$10 = 10$

true

infinite of solutions

What did the solution tell us?

Infinite solutions indicate the same line.

# Assignment

4..... 40 - 43, 44c

You can replace any question from the above assignment with a more challenging system

$$x^2 + y^2 = 25$$

$$y = x^2 - 13$$

You can check your answer with me tomorrow

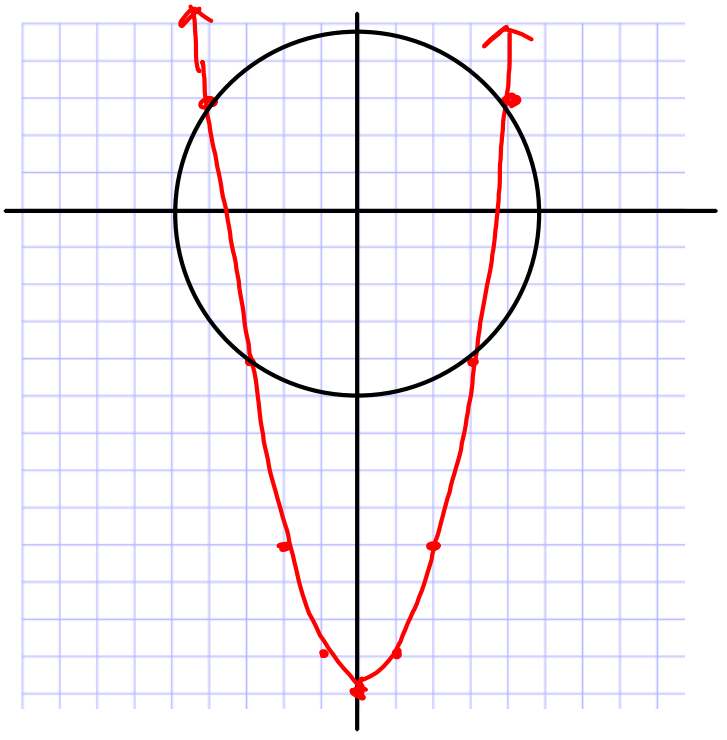
with that in mind

4 - 37

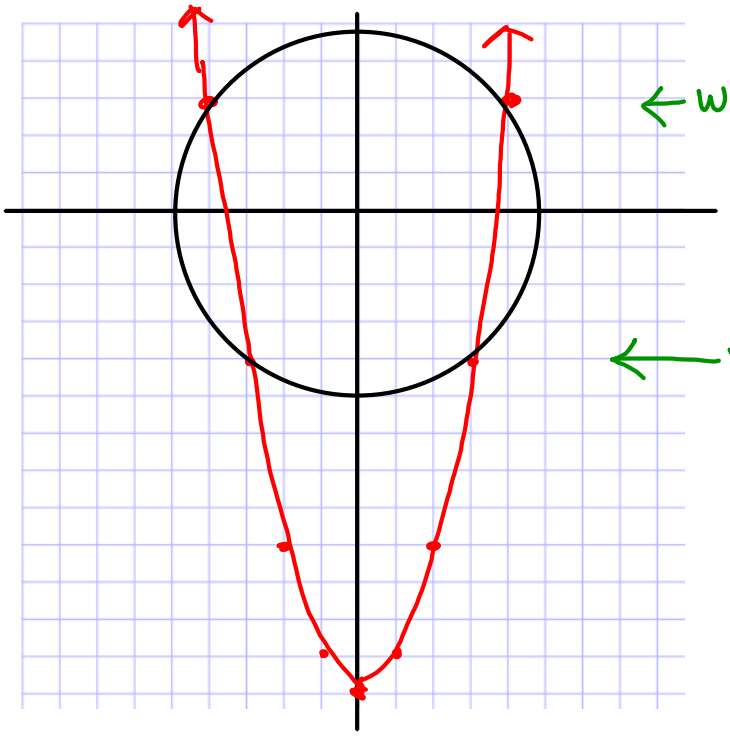
a
b you

c together

(b)



(b)



← when $y = 3$

← when $y = -4$

© combine to create new

© $x^2 + y^2 = 25$ $y = x^2 - 13$

the difficult way

$x^2 + (x^2-13)^2 = 25$

$x^2 + (x^2-13)(x^2-13) = 25$

Yikes!

or ....

$x^2 + y^2 = 25$ $y = x^2 - 13$

the easier way

$x^2 = y + 13$

$\sqrt{\quad}$ $\sqrt{\quad}$

$x = \pm\sqrt{y+13}$

$(\pm\sqrt{y+13})^2 + y^2 = 25$

$y + 13 + y^2 = 25$

$y^2 + y - 12 = 0$

$y = -4$ $y = 3$

(d)

$y = -4$ $y = 3$

$x^2 + y^2 = 25$

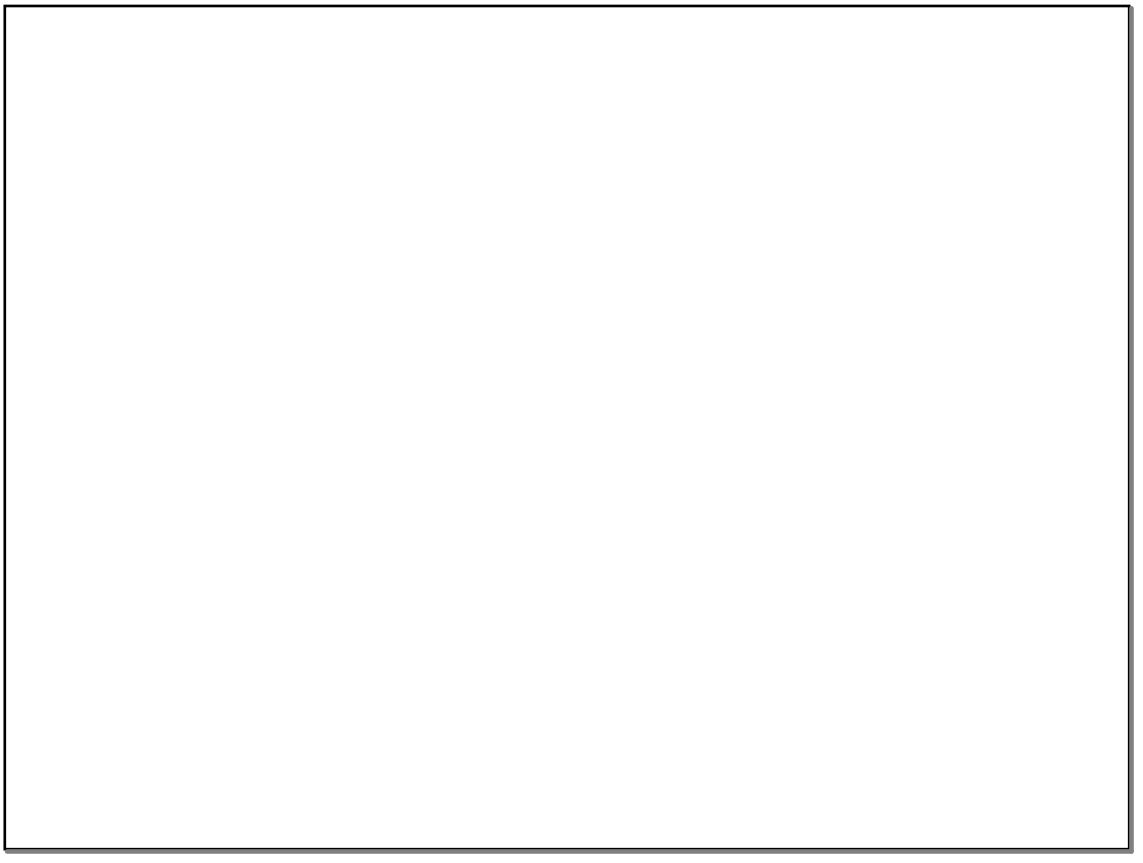
$y = x^2 - 13$

$-4 = x^2 - 13$

$9 = x^2$

$x = \pm\sqrt{9}$

$x = \pm 3$

two of the four points are $(-3, -4)$ and $(3, -4)$

then plug in $y = 3$ to find the other two