Warm Up

Pick up the Warm Up after marking the HW Tally

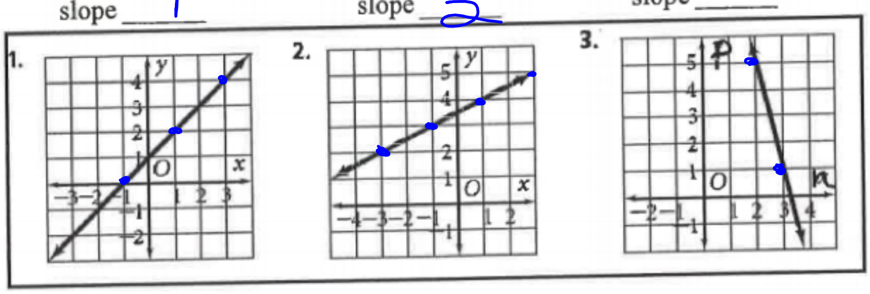
have your graphing calculator out

Come up right now to check one out if needed.

---

1. Find the slope of each line

slope 1 slope $\frac{1}{2}$ slope $-\frac{4}{1}$ which is -4

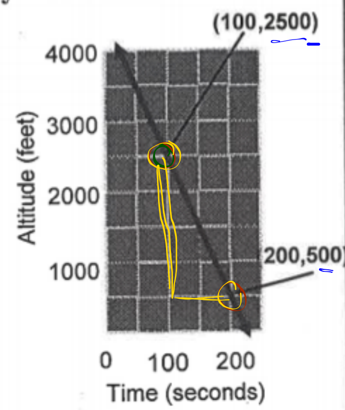


2.

Rate of Change and Slope

Not all graphs have the same x and y axis values

The graph shows the altitude of an airplane as it comes in for a landing. Find the rate of change.



$$\frac{\text{rise}}{\text{run}} = \frac{2500 - 500}{100 - 200} = \frac{2000 \text{ feet}}{-100 \text{ sec}}$$

$$-20 \, \frac{\text{feet}}{\text{sec}}$$

$$\frac{\Delta y}{\Delta x} =$$ The plane is descending at 20 feet per sec.

3. Factor the quadratic function $f(x) = 14x^2 + 3x - 2$ into two binomial factors.

(note: This is not an equation so there is nothing to solve. You are just factoring)

$f(x) = (7x-2)(2x+1)$

	$2x$	1
$7x$	$14x^2$	$7x$
-2	$-4x$	-2

$-28x^2$

$3x$

$-x \quad 28x$

$-2x \quad 14x$

$-4x \quad 7x$

4. This time you will solve an equation. Solve the following quadratic equation using the method of Factoring+Zero Product Property.

$0 = -x^2 + 18x + 40$

$x^2 = 18x + 40$ *Don't forget to set the quadratic equation equal to zero first.*

$x^2 - 18x - 40 = 0$

$\cancel{(x+20)(x-2)} = 0$

$(x-20)(x+2) = 0$

ZPP

$x - 20 = 0$ $x + 2 = 0$

$x = 20$ $x = -2$

$0 = (-x+20)(x+2)$

	x	
x	x^2	$20x$
	$-2x$	-40

$-40x^2$

$-18x$

$-x$	$40x$
$-2x$	$20x$
$-4x$	$10x$
$-5x$	$8x$

Another method for solving quadratic equations is using the **Quadratic Formula**. This method is particularly helpful for solving quadratic equations that are difficult or impossible to factor. Before using the Quadratic Formula, the quadratic equation you want to solve must be in standard form (that is, written as $ax^2 + bx + c = 0$).

In this form, a is the coefficient of the x^2-term, b is the coefficient of the x-term, and c is the constant term. The Quadratic Formula is stated at right.

$$\boxed{x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}}$$

This formula gives two possible solutions for x. The two solutions are shown by the "±" symbol. This symbol (read as "plus or minus") is shorthand notation that tells you to evaluate the expression twice: once using addition and once using subtraction. Therefore, Quadratic Formula problems usually must be simplified twice to give:

$$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \quad \text{or} \quad x = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

Of course if $\sqrt{b^2 - 4ac}$ equals zero, you will get the same result both times.

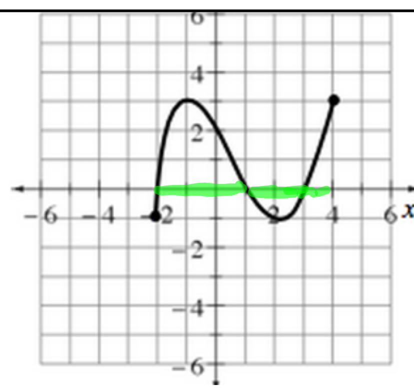
To solve $x^2 - 3x - 10 = 0$ using the Quadratic Formula, substitute $a = 1$, $b = -3$, and $c = -10$ into the formula, as shown below, then simplify.

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-10)}}{2(1)} = \frac{3 \pm \sqrt{49}}{2} = \frac{3+7}{2} \text{ or } \frac{3-7}{2}$$

$$x = 5 \text{ or } x = -2$$

HW Questions

34



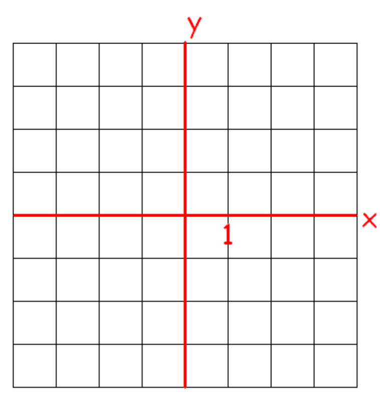
1-34. Examine $g(x)$ graphed at right. Homework Help ✎

a. Which x -values have points on the graph? That is, describe the domain of $g(x)$. $-2 \le x \le 4$

b. What are the possible outputs for $g(x)$? That is, what is the range?

c. Ricky thinks the range of $g(x)$ is: $-1, 0, 1, 2,$ and 3. Is he correct? Why or why not?

d. Draw a graph for another function with the same domain and range as $g(x)$.



35a $f(x) = 3x^2 - 5$ $g(x) = \sqrt{x-5} + 2$

a) $f(5) = \boxed{3(5)^2 - 5} = 70$

b) $g(5) =$

35ef $f(x) = 3x^2 - 5$ $g(x) = \sqrt{x-5} + 2$

e $f(x) + g(x)$

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

$3x^2 + \sqrt{x-5} - 3$

f $g(x) - f(x)$

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

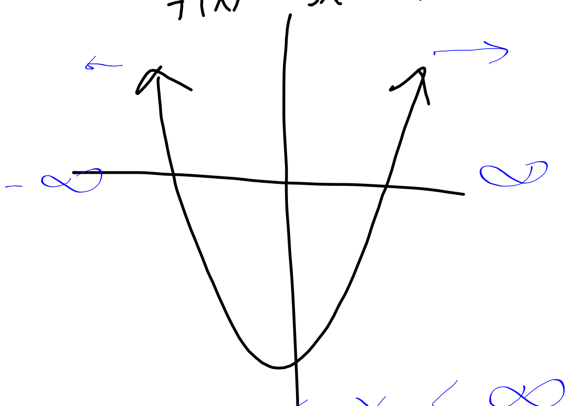
$\sqrt{x-5} + 2 - 3x^2 + 5$

$-3x^2 + \sqrt{x-5} + 7$

$$\frac{\overset{10}{x}+4}{2}$$

$$\frac{\cancel{4}^{2}}{\cancel{2}_{1}} = 2$$

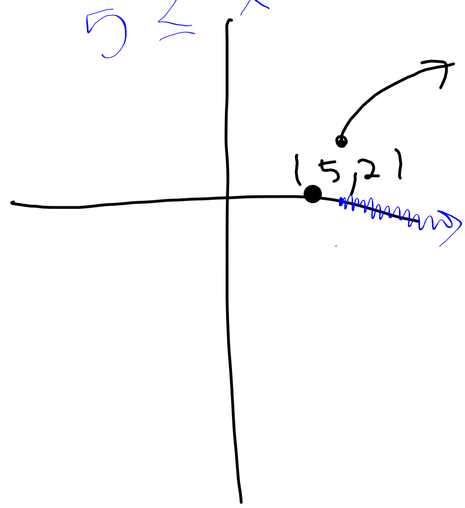
g) $f(x) = 3x^2 - 5$



$-\infty < x < \infty$

h) $g(x) = \sqrt{x-5} + 2$

$5 \leq x < \infty$



g) domain

$-\infty < x < \infty$

range

$y \geq -5$

$-5 \leq y < \infty$

$\boxed{37}$ c) $x = y^2$ d) $x = 2y^2 - 4$

$y^2 = x$

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

$y = \pm\sqrt{x}$

37e $x = (y-5)^2$

$(y-5)^2 = x$

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

$y - 5 = \pm\sqrt{x}$

$+5 \quad +5$

$y = 5 \pm \sqrt{x}$

or

$\pm\sqrt{x} + 5$

38 $f(x) = 2x - 7$

$y = 2x - 7$

a) $f(0)$

$(\ , \ )$

b) Solve $f(x) = 0$

$0 = 2x - 7$

$7 = 2x$

$x = \frac{7}{2}$

$(\ , \ )$

c) They are both axis intercepts

x-int $(0, -7)$

y-int $(3.5, 0)$

40a

$4(x-1) - 2(3x+5) = -3x-1$

$4x-4 - 6x - 10 = -3x-1$

$-2x - 14 = -3x - 1$

$+14 \qquad +14$

$-2x = -3x+13$

$+3x \qquad +3x$

$x = 13$

Homework - Turn In

on test day

All homework from the current chapter should be with you in class every day.

Heads up:
There will be random mid chapter recording checks to see if you are following the guidelines listed on the top of the HW Recording Sheet.

Now open your own notes and solve the following quadratic equation using the infamous quadratic equation.

Your friendly neighborhood MATH teacher has a few suggestions for you !

Solve using the Quadratic Formula

$$14x^2 - 2 = -3x$$

$+3x \qquad +3x$

$$14x^2 + 3x - 2 = 0$$

$0 = -14x^2 - 3x + 2$

$a = 14$ ✓

$b = 3$ ✓

$c = -2$ ✓

$$ax^2+bx+c=0$$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

$a=$

$$=\frac{-(3)\pm\sqrt{\boxed{(3)^2-4(14)(-2)}}}{2(14)}$$

$$=\frac{-3\pm\sqrt{121}}{28}=\frac{-3\pm 11}{28}$$

$$x=\frac{-3\pm 11}{28}$$

$$x=\frac{-3+11}{28}=\frac{8}{28}=\frac{2}{7}$$

$$x=\frac{-3-11}{28}=\frac{-14}{28}=\frac{-1}{2}$$

$x=\frac{2}{7}$ $x=-\frac{1}{2}$

Shell:

$X =$

$$X = \frac{-(3) \pm \sqrt{(3)^2 - 4(14)(-2)}}{2(14)}$$

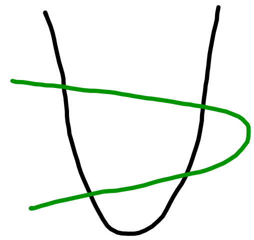
$$X = \frac{-3 \pm \sqrt{}}{28} =$$

$$x = \frac{-3 \pm \sqrt{121}}{28}$$

HW is important
but, so are Warm Ups

do not work on "finishing" your homework during class.

how many intersections can two parabolas have ?



TWO Quaradatic Functions

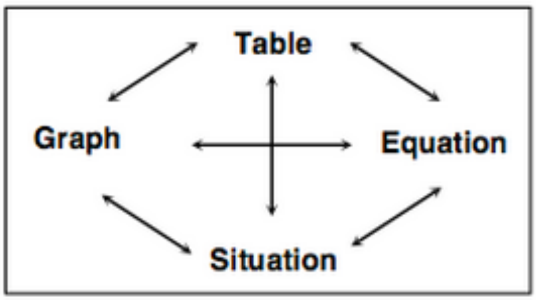
$$\boxed{\begin{aligned} f(x) &= 2x^2 - 5x + 6 \\ g(x) &= -2x^2 - x + 30 \end{aligned}}$$

A thought question for your group

How can we find out the points of intersection of these 2 parabolas ?

TODAY: Use several methods to find intersections

GRAPHS tables Equations



How can we find it using graphs?

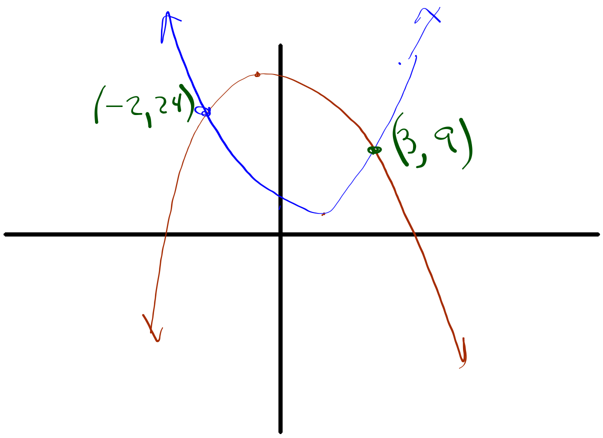
How can we find it in tables?

How can we find it using equations?

Finding Intersections between two functions

$f(x) = 2x^2 - 5x + 6$

$g(x) = -2x^2 - x + 30$



and with tables

any disadvantages ?

B.B.

Dog

Chicken

$\boxed{1-44}$ $f(x) = 2x^2 - 5x + 6$ $g(x) = -2x^2 - x + 30$

w/o GDC

$2x^2 - 5x + 6 = -2x^2 - x + 30$

set equal to zero

$+x$ -30 $+2x^2$

$4x^2 - 4x - 24 = 0$

$4(x^2 - x - 6) = 0$ $4m = 0$

divide by 4

$x^2 - x - 6 = 0$

$(x-3)(x+2) = 0$

ZPP

$x - 3 = 0$ $x = 3$

~~$x+3=0$~~ $x = -3$

$x - 2 = 0$ $x = 2$

$(3, \ )$ $(2, \ )$

---

front: LCQ Learning Check Quiz

10% drop lowest 1/3

Back side: Non-graded Pre-check for a chapter 2 skill

get some free points on the LCQ if you do your best

Mr. C $\rightarrow$ Pdf

Assignment

Do you have a sprial notebook <u>for notes</u> ?

separate folders for handouts ?

pens of a different color?

$\boxed{1}$..... 46, 47bc, 48b, 49-52

1 .....46, 47bc, 48b, 49-52

$5x - y = 35$

$3x + y = -3$

Could use elimination

$5x - y = 35 \rightsquigarrow y = 5x - 35$

$3x + y = -3$

Can use substitution (less efficient in this case)

$3x + y = -3$

$3x + (5x - 35) = -3$

$8x - 35 = -3$

$+35 \quad 35$

$8x = 32$

$x = 4$

$x = 4$

$y = -15$

$(4, -15)$

If an approximate answer is needed, we can also use a GDC, graphing display calculator

$5x - y = 35$

$+y \quad +y$

$5x = y + 35$

$-35 \quad -35$

$y = 5x - 35$

$3x + y = -3$

$-3x \quad -3x$

$y = -3x - 3$