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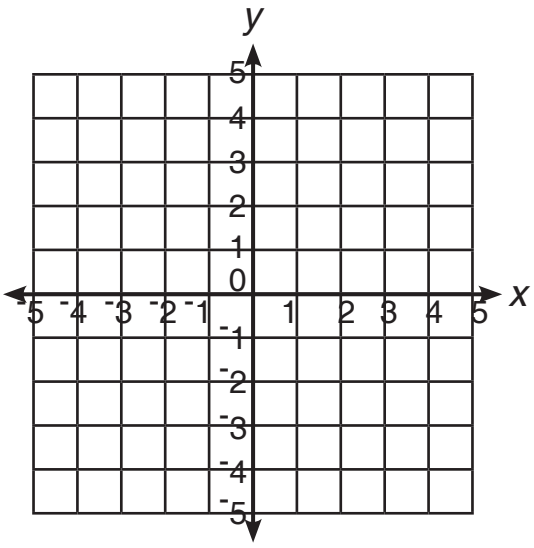
UNIT 1 – THE BASICS OF GRAPHING

UNIT 3 – LINEAR EQUATIONS

COORDINATE PLANE

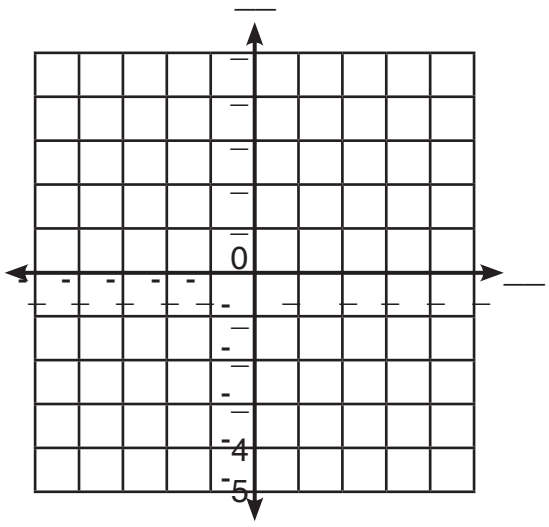
Stand up. Stretch out your arms. You have made a human coordinate plane!

A coordinate plane is a graph. It has two number lines that cross. The *x* axis is horizontal like your arms. The *y* axis is vertical. It goes up and down like your body.



The axes cross at (0, 0), the point of origin. The arrows on the lines mean the lines go on forever.

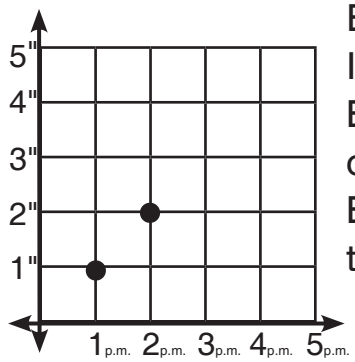
The Game: Look at the coordinate graph below. Label the *x* axis and the *y* axis. Include the positive and negative numbers.



TELLING THE FUTURE

Look at trends to predict the future.

Break It Down:
You can predict the future! Not really, but you can have an idea about what might happen.

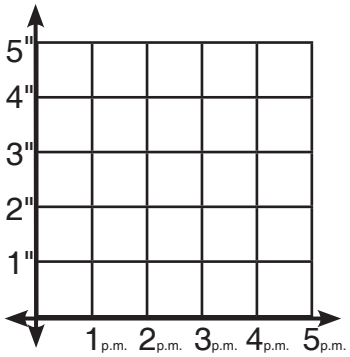


Example:
It began to rain at noon.
By 1 p.m., it had rained one inch.
By 2 p.m., it had rained two inches.

If it keeps raining at the same rate, how many inches of rainfall will there be by 3 p.m.? ___ inches

The Game: Plot the rainfall, graph the line, and fill in the blanks.

It began to rain at noon.
By 1 p.m., it had rained one inch.
By 2 p.m., it had rained two inches.
By 4 p.m., it had rained a total of four inches.



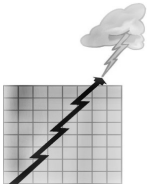
Plot the rainfall. Draw a line through the points.

It keeps raining!

What do you think the total rainfall will be at 5 p.m.? ___ inches

What do you think the total rainfall will be at 6 p.m.? ___ inches

Do you predict that there is a chance of a flood? _____



What is another word for guess or foretell? _____

UNIT 5

QUADRATIC

Quadratic equations explain about real life, such as a thrown ball's path through the air.

Break It Down:
A quadratic equation is an equation with one or more variables in it raised to the second power, or squared, and there are no variables in it that have a higher power than that. Look for x^2 or y^2 in it!

Attention! This is the form for a quadratic equation that we are going to use:

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

(a, b, and c can have any value, except that a cannot be 0.)

Examples of quadratic equations:

$0 = 2x^2 + 5x + 3$ $\qquad$ $x^2 + 3x + 5 = 0$

$3x^2 - 4x + 3 = 0$ $\qquad$ $^-5x^2 - 2x + 3 = 7$

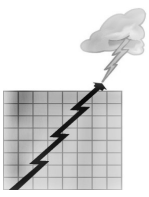
This is a quadratic equation too:

$0 = x^2 - 2x$ $\qquad$ Don't be tricked! $a = 1$, $b = ^-2$, and $c = 0$

The Game: Write the term including the variable that is raised to the second power in each quadratic equation.

Ex: $3x^2 - 4x + 3 = 0$ $\underline{3x^2}$

$y = ax^2 + bx + c$	___	$^-5x^2 - 2x + 3 = 7$	___
$0 = 2x^2 + 5x + 3$	___	$0 = x^2 - 2x$	___
$y = 1x^2 + 3x + 2$	___	$3x^2 - 4x + 3 = 0$	___
$0 = 1x^2 + ^-2x$	___	$x^2 + 3x + 5 = 0$	___

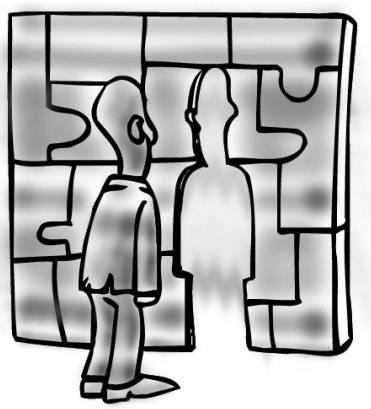


What is the form that we are using for a quadratic equation?

_____

UNIT 6

IN STANDARD FORM



Rewrite quadratic equations in standard form.

Break It Down:

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

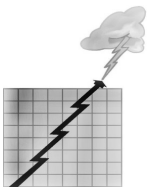
	$y = x^2 + 2$
Change to standard form. ➜	$y = x^2 + 0x + 2$
Find *a.* ➜	$a = 1$
Find *b.* ➜	$b = 0$
Find *c.* ➜	$c = 2$

	$-3x^2 + x + 1$
Change to standard form. ➜	$y = -3x^2 + x + 1$
Find *a.* ➜	$a = -3$
Find *b.* ➜	$b = 1$
Find *c.* ➜	$c = 1$

The Game: Fill in the blanks.

	$x^2 - 1$
Change to standard form. ➜	$y = 1x^2 + 0x +$ _____
Find *a.* ➜	$a = 1$
Find *b.* ➜	$b = 0$
Find *c.* ➜	$c =$ _____

	$y = x^2 - 2x$
Change to standard form. ➜	$y =$ _____$x^2 - 2x +$ _____
Find *a.* ➜	$a = 1$
Find *b.* ➜	$b = -2$
Find *c.* ➜	$c =$ _____

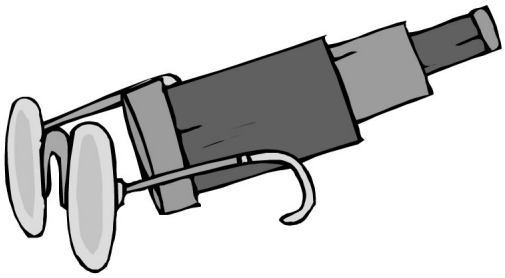


Does a quadratic equation have a constant term? _____

UNIT 6

SHAPE

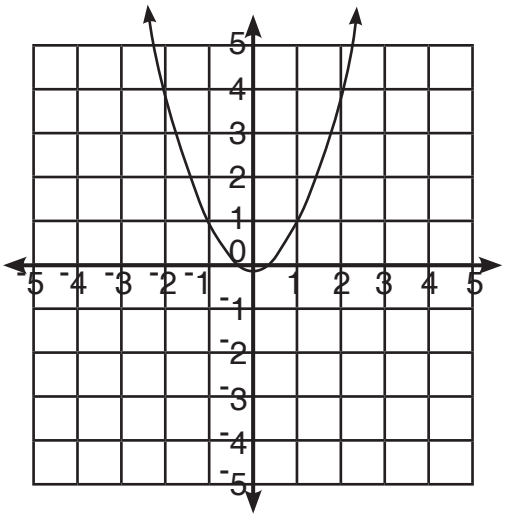
The shape of the parabola is important.



Break It Down:
The shape tells about the coefficient.

The coefficient is a number that is multiplied by a letter (variable).
Examples:

2 is the coefficient of x^2. ➜ $2x^2$
$^-2$ is the coefficient of x^2. ➜ $^-2x^2$



x^2 or $1x^2$
This parabola opens upward.
The coefficient is positive.
The coefficient is 1.

Does the U-shaped parabola look like a cup or a cap? _____

The left half of this parabola is the mirror image of the right half. The parabola is vertical and is symmetrical about the *y*-axis, so it is an even function.

The Game: Write the coefficients of x^2.
Write P for POSITIVE or N for NEGATIVE.

	Coefficient	P or N
$2x^2$	____	____
$1x^2$	____	____
$^-5x^2$	____	____
$4x^2$	____	____
$6x^2 + 3$	____	____

UNIT 6