

1. What do you remember about the equation for a line? Please talk with your group and come up with as much as possible

Recall that as long as we have two points, given as two separate sets of ordered pairs in the form  $P_1(x_1, y_1)$  and  $P_2(x_2, y_2)$ , we can form a line through these points. There are a number of relevant formula associated with the equation for a line:

$$\text{Slope } m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$$

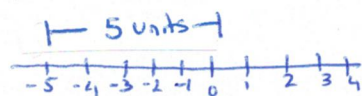
Point-slope form of line:  $y - y_1 = m(x - x_1)$

Slope-intercept:  $y = mx + b$  for

2. How do you read the following statement:  $|x|$ . What does this notation mean? y-intercept at (0, b)

The statement  $|x|$  is read in English: "the absolute value of  $x$ ".

The absolute value operation indicates the "distance" the number  $x$  is away from zero on a number line. For example,  $|-5| = 5$  since the number  $x = -5$  is 5 units away from zero



3. How do you read the following statement:  $x^2$ . What does this notation mean?

The statement  $x^2$  is read in English as "x squared" or

"variable  $x$  to the second power". In this notation, the power of two  $\rightarrow$   $(2)$  counts the number of times we multiply the base  $x$  by itself

with  $x^2 = x \cdot x$  (base  $x$  multiplied by itself two times).

4. What does the word "ratio" mean? Can you give an example of a ratio of two numbers?

The word ratio is a synonym for the word fraction, which is a number that includes a numerator and denominator, in the form

numerator  $\rightarrow$   $\frac{N}{D}$ . For example,  $\frac{1}{2}$  and  $\frac{7}{10}$  are both ratios.  
denominator  $\rightarrow$   $D$

5. Explain power notation:  $x^n$

The statement  $x^n$  is read in English "variable  $x$  to the  $n^{\text{th}}$  power"

In this case, we call variable  $x$  the base and the constant number  $n$  the power. When we write  $x^n$ , we say this represents base  $x$  multiplied by itself  $n$  times. For example:

$$x^2 = x \cdot x \quad x^4 = x \cdot x \cdot x \cdot x$$

$$x^3 = x \cdot x \cdot x \quad x^5 = x \cdot x \cdot x \cdot x \cdot x$$

6. How do you read the following statement:  $\sqrt{x}$ . What does this notation mean?

The statement  $\sqrt{x}$  is read in English as "the square root of variable  $x$ ." If we say that  $\sqrt{x} = y$ , this implies that

$y^2 = x$  ( $y$  is a number such that if we multiply  $y$  by itself twice,

we get  $x$ ). For example,  $\sqrt{64} = 8$  since  $8^2 = 64$ .

In this class, we will focus on our energy on learning techniques to solve algebraic equations. We will focus on six major types of equations. Using the work you did on questions 1 – 6, try to match the given algebraic statements with the proper names for these statements.

Linear equation F.

Both sides of the equals sign in option F. take the form of a linear function having the classic  $y = mx + b$  format

✓  
A.  $2x^2 + x = 14 - x^2$

Quadratic equation A.

(Hint: in Spanish, the word Cuadro means square)

Remember: a quadratic equation includes an equals sign with a square power on at least one side of the equality, as in option A.

✓  
B.  $\frac{x+1}{x+2} + \frac{x}{x-2} + 1 = \frac{8}{x^2-4}$

Absolute value equation G.

Involves/includes the abs value symbol on one side of equation as seen in option G.

✓  
C.  $2x^3 - 4 = 20 - x^3$

Rational equation B.

an equation that involves ratios (fractions) with variables in the denominator

✓  
D.  $\sqrt[2]{x-1} + 3 = x$

Power equation C.

3 ← constant power  
→ X  
variable base

Power equations have a term  $x^n$  where  $n \geq 3$  on at least one side of equals sign (if  $n=2$ , we call it a quadratic equation).

✓  
E.  $x^2 + 6x + 9$

Radical equation D.

In option D, we see

an equation that includes a radical sign in the form  $\sqrt[n]{x-1}$  on the right-hand side of equals sign.

✓  
F.  $3x + 2 = \frac{1}{2}x - 4$

Algebraic expression E.

No equal sign in option E. statements with no equals sign are called expressions

✓  
G.  $2 \cdot |2x - 1| - 4 = 8$