Algebra Formula Study Guide for ACT   (Pre and Elementary Algebra)

Mean/Median/Mode

- *Mean* = **Average** of the set of numbers
- *Median* = **Middle** of the set of numbers when ordered from least to greatest
- *Mode* = **Most common** number in a set of numbers.
- *Range*= **Difference** between the largest and smallest values in a set.

Prime Numbers

A prime number is a number that is divisible by only one and itself:

EX: 2, 3, 5, 7, 11, 13

- Zero is not prime
- 1 is not prime,
- 2 is the first prime number and ONLY even prime

Clue Words in word problems

+	-	X	÷	=
Add	Subtract	Multiply	Divide	Equal
Plus	Minus	Times	Quotient	Is
Sum	Difference	Product	Per	
More than	Less than	Each		
Increased by	Decreased by	Of		
Total				
In All				

Absolute Value

Absolute Value means the distance from zero on the number line.

Ex: $|8x - 5| \leq 11$

Absolute value needs to be solved TWICE. Remember to flip the sign for the second equation.

$$8x - 5 \leq 11 \quad \text{and} \quad 8x - 5 \geq -11$$

$$8x \leq 16 \qquad\qquad 8x \geq -6$$

$$x \leq 2 \qquad\qquad x \geq -\frac{3}{4}$$

Probability

$$\text{Probability of an Event Happening} = \frac{\text{Number of ways it can happen}}{\text{Total Number of Outcomes}}$$

Multiples

The multiple of a number is the product generated when that number is multiplied by an integer

EX: Multiples of 3: 3, 6, 9, 12, …

Least Common Multiple (LCM) = is the name given to the lowest multiple that two particular numbers share.

EX: LCM of 6 and 8 = 24.

Factors

A factor of a number is an integer that divides evenly into the number

EX: Factors of 20 = 1, 2, 4, 5, 10, 20

Greatest Common Factor (GCF) = is the largest factor that the two numbers share

EX: GCF of 18 and 24 = 6

Exponents and Roots

Rule name	Rule	Example
Product rules	$a^n \cdot a^m = a^{n+m}$	$2^3 \cdot 2^4 = 2^{3+4} = 128$
	$a^n \cdot b^n = (a \cdot b)^n$	$3^2 \cdot 4^2 = (3 \cdot 4)^2 = 144$
Quotient rules	$a^n / a^m = a^{n-m}$	$2^5 / 2^3 = 2^{5-3} = 4$
	$a^n / b^n = (a / b)^n$	$4^3 / 2^3 = (4/2)^3 = 8$
Power rules	$(b^n)^m = b^{n \cdot m}$	$(2^3)^2 = 2^{3 \cdot 2} = 64$
	$^m\sqrt{(b^n)} = b^{n/m}$	$^2\sqrt{(2^6)} = 2^{6/2} = 8$
Negative exponents	$b^{-n} = 1 / b^n$	$2^{-3} = 1/2^3 = 0.125$

FOIL Method

FOIL Method – **F**IRST, **O**UTER, **I**NNER, **L**AST

$$(x + 5) * (x - 4) = x^2 - 4x + 5x - 20$$

Combine terms → $x^2 - x - 20$

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