

## MULTIPLYING (ALGEBRA)

1<sup>st</sup> MATHIES CAN SEEM LAZY.

If there's nothing between a # & a letter,  
it means times.

$$3x \Rightarrow 3 \cdot x$$

Rule for multiplying

#s with #s, letters with letters.

Ex:  $3x \cdot 4x = 3 \cdot x \cdot 4 \cdot x$   
 $= 3 \cdot 4 \cdot x \cdot x$   
 $= 12 x^2$

EXPONENTS MEAN **REPEATED** MULTIPLICATION.

$$\begin{aligned}
 \text{Ex: } 3x^2 \cdot 4x &= 3 \cdot x \cdot x \cdot 4 \cdot x \\
 &= 3 \cdot 4 \cdot x \cdot x \cdot x \\
 &= 12x^3
 \end{aligned}$$


### THE SHORTCUT

WHEN MULTIPLYING THE SAME VARIABLES, YOU  
JUST ADD THE EXPONENTS.

$$\begin{aligned}
 &5x^3 \cdot 10x^4 \\
 &= 5 \cdot x \cdot x \cdot x \cdot 10 \cdot x \cdot x \cdot x \cdot x \\
 &= 5 \cdot 10 \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \\
 &= 50x^{3+4} \\
 &= 50x^7
 \end{aligned}$$

## MULTIPLYING WITH ( )

RULE: WHATEVER IS OUTSIDE THE ( ) AFFECTS  
EACH TERM INSIDE THE ( ).

$$3(x + 1) = 3(x) + 3(1)$$


$$= 3x + 3$$

\* INCLUDE THE SIGNS WHEN YOU  
MULTIPLY, THEN ADD UP THE TERMS.

$$-4x(x - 6) =$$

$$(-4x)(x) + (-4x)(-6)$$

$$-4x^2 + 24x$$

WHAT IF YOU GET A ( ) TIMES A ( ) ?

RULE: EVERYTHING IN THE FIRST ( ) GETS A TURN WITH EACH THING IN THE 2<sup>nd</sup> ( ).

$$\begin{array}{c} \swarrow \quad \searrow \\ (2x+1) \quad (3x-4) \\ \nwarrow \quad \nearrow \end{array}$$

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

$$6x^2 + \underbrace{-8x + 3x}_{-5x} + -4$$

$$6x^2 - 5x - 4$$

$$(2x - 1)(3x - 4)$$

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

$$6x^2 + -8x + -3x + 4$$

$$\boxed{6x^2 - 11x + 4}$$