SOLVING EQUATIONS

* SOLVING MEANS THAT YOU ARE TRYING TO FIND A VALUE FOR "x" THAT MAKES THE EQUATION TRUE

YOU CAN DO THIS TWO WAYS

1) GUESS NUMBERS UNTIL YOU FIND ONE THAT WORKS
2) WORK BACKWARDS TO GET "x" AS THE ONLY THING ON ONE SIDE OF THE = SIGN

EXAMPLE 1:

$x + 3 = 8$

$-3 \quad -3$

$x = 5$

CANCELS OUT TO 0

So $x = 5$

THIS MEANS: WHAT NUMBER PLUS 3 WILL EQUAL 8?

USE OPPOSITES! INSTEAD OF ADDING 3, SUBTRACT 3 FROM BOTH SIDES TO BALANCE

EXAMPLE 2:

$15 = b - 4$

$+4 \quad +4 \quad -4+4=0$

$19 = b$

So $b = 19$

THIS MEANS: WHAT NUMBER MINUS 4 WILL EQUAL 15?

USE OPPOSITES! INSTEAD OF MINUS 4, ADD 4 TO BOTH SIDES TO BALANCE!

ALWAYS ASK YOUR SELF IF IT MAKES SENSE...

IS $19 - 4 = 15$? YES! GREAT! WE DID THE PROBLEM CORRECTLY

EXAMPLE 3:

THIS IS A DIVISION/FRACTION BAR

$$\frac{3x}{3} = \frac{18}{3}$$

$$x = 6$$

THIS MEANS: WHAT NUMBER TIMES 3 EQUALS 18?

WORK BACKWARDS! INSTEAD OF MULTIPLYING, DIVIDE BOTH SIDES BY 3

NOTE: $\frac{3}{3} = 1$ WHICH GIVES US $1x$ BUT ANYTHING MULTIPLIED BY 1 STAYS THE SAME SO WE DO NOT NEED TO WRITE THE 1

EXAMPLE 4:

REMEMBER: A FRACTION IS JUST A DIVISION PROBLEM!

$$8 \cdot 5 = \frac{x}{8} \cdot 8$$

$$40 = x$$

THIS MEANS: WHAT NUMBER DIVIDED BY 8 = 5?

WORK BACKWARDS: THE OPPOSITE OF DIVIDE IS MULTIPLY! MULTIPLY BOTH SIDES BY 8 TO GET "x" BY ITSELF

NOTE: $\frac{x}{8} \cdot 8$ MEANS $\frac{8x}{8} \cdot \frac{8}{8} = 1$ SO THE 8s CANCEL OUT AND WE ARE JUST LEFT WITH X

DOES IT MAKE SENSE? IS 40 DIVIDED BY 8 EQUAL TO 5?
YES!