

### 4-1D Solving One-Step Equations by Adding & Subtracting

Algebraic Expression - a number, variable, and/or operation

Algebraic Equation - a number, variable, operation, and an equals sign.

Solution - the value of the variable that makes the equation true.

To Solve Equations: *(opposite)*

- Use inverse operations to isolate the variable.  
*subtraction → addition*  
*multiplication → division*  
*get the variable by itself*
- Whatever you do to one side of the equation, you must do to the other side. (Properties of Equality)
- Always check & graph your answer!!!

Notes: \*plus/minus signs also indicate whether a number or variable is positive/negative!!!

\*add, subtract, and divide below the problem (use fraction bar instead of division symbol); multiply to the side of the problem

Graphing on a number line.

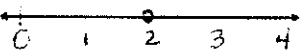
- Draw, label number line using arrows and five values - all values are integers with solution placed in the middle.
- Plot a filled in dot on the number line above the solution.

REMEMBER: Integer Rules

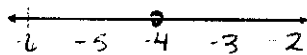
- Add:
  - Same signs → Add the numbers, keep the sign
  - Different signs → Subtract (larger number - smaller number), keep sign of larger number
- Subtract: Keep (1) number the same! → Change (subtraction to addition) → Change (2) number; follow addition rules

**Ex. 1: Graph each solution on a number line.**

A.  $x = 2$



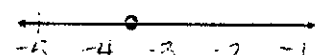
B.  $x = -4$



C.  $x = 1.2$  *between 1 and 2*



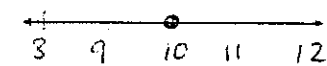
D.  $x = -3.5$  *between -3 and -4*



**Ex. 2: Solve each equation and check your solution. Graph the solution on a number line.**

A.  $x + 5 = 15$

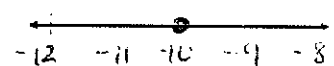
*same*  
 $x + 5 = 15$   
 $-5 \quad -5$   
 $\hline x = 10$



check:  $x + 5 = 15$   
 $(10) + 5 = 15$   
 $\checkmark 15 = 15$

B.  $6 + y = -4$

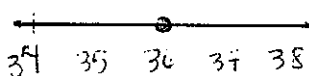
$6 + y = -4$   
 $-6 \quad -6$   
*opposites*  
 $\hline y = -10$



check:  $6 + y = -4$   
 $6 + (-10) = -4$   
 $\checkmark -4 = -4$

C.  $-21 + a = 15$

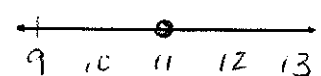
$-21 + a = 15$   
 $+21 \quad +21$   
 $\hline a = 36$



check:  $-21 + a = 15$   
 $-21 + (36) = 15$   
 $\checkmark 15 = 15$

D.  $-13 = -24 + r$

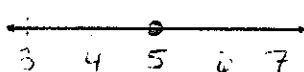
$-13 = -24 + r$   
 $+24 \quad +24$   
 $\hline 11 = r$   
 $r = 11$



check:  $-13 = -24 + r$   
 $-13 = -24 + (11)$   
 $\checkmark -13 = -13$

E.  $n - 9 = -4$

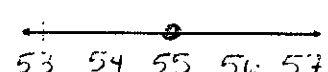
$n - 9 = -4$   
 $+9 \quad +9$   
 $\hline n = 5$



check:  $n - 9 = -4$   
 $(5) - 9 = -4$   
 $\checkmark -4 = -4$

F.  $3 = x - 52$

$3 = x - 52$   
 $+52 \quad +52$   
 $\hline 55 = x$   
 $x = 55$



check:  $3 = x - 52$   
 $3 = (55) - 52$   
 $\checkmark 3 = 3$