

### 3.5 Part 2 - Solving Multi-step equations

#### Steps:

- ① ➤ Simplify each side of the equation first
  - usually the distributive property or DP  $-3(x+4) \rightarrow -3x-12$
  - combining like terms CLT  $x+5+3x-2 \rightarrow 4x+3$
- ② ➤ add or subtract the constant away from the variable
- ③ ➤ multiply or divide the number with the variable

#### Examples:

1.  $-8d - 5d + 2 + 7d - 5 = 62 + 10$

$$\begin{array}{r} -13 \\ \underline{7} \\ -6d + 3 \\ \underline{+3} \\ -6d = 72 \\ \underline{+3} \\ -6d = 75 \\ \underline{-6} \\ d = -12.5 \end{array}$$

or  $\boxed{-\frac{25}{2}} = \boxed{-12\frac{1}{2}}$

2.  $-4(m+3) = 24$

$$\begin{array}{r} -4m - 12 = 24 \\ \underline{+12} \quad \underline{+12} \\ -4m = 36 \\ \underline{-4} \quad \underline{-4} \\ m = -9 \end{array}$$

3.  $4p + 5 - 7p = 1$

$$\begin{array}{r} -3p + 5 = 1 \\ \underline{-5} \quad \underline{-5} \\ -3p = -4 \\ \underline{-3} \quad \underline{-3} \\ p = \frac{4}{3} \end{array}$$

\* leave as a fraction if repeating decimal

4.  $3(2n-7) = 5 + 7 - 3$

$$\begin{array}{r} 6n - 21 = 9 \\ \underline{+21} \quad \underline{+21} \\ 6n = 30 \\ \underline{6} \quad \underline{6} \\ n = 5 \end{array}$$

5.  $144 = -12(x+5)$

$$\begin{array}{r} 144 = -12x - 60 \\ \underline{+60} \quad \underline{+60} \\ 204 = -12x \\ \underline{-12} \quad \underline{-12} \\ -17 = x \end{array}$$

$$6. \quad 2(n + 5) = -2$$

$$\begin{array}{r|l} 2n + 10 & = -2 \\ \underline{-10} & \underline{-10} \\ 2n & = -12 \\ \underline{\div 2} & \underline{\div 2} \end{array}$$

$$\boxed{n = -6}$$

$$7. \quad 7c - 2c = 45$$

$$\begin{array}{r|l} 5c & = 45 \\ \underline{\div 5} & \underline{\div 5} \end{array}$$

$$\boxed{c = 9}$$

$$8. \quad 14a + 35a - 43 = 447$$

$$\begin{array}{r|l} 49a - 43 & = 447 \\ \underline{+43} & \underline{+43} \\ 49a & = 490 \\ \underline{\div 49} & \underline{\div 49} \end{array}$$

$$\boxed{a = 10}$$

$$9. \quad 4 + 2.2h = -3.7$$

$$\begin{array}{r|l} 4 + 2.2h & = -3.7 \\ \underline{-4} & \underline{-4} \\ 2.2h & = -7.7 \\ \underline{\div 2.2} & \underline{\div 2.2} \end{array}$$

$$\boxed{h = -3.5}$$