## Zack's Phone Plan

Zack is investigating phone plans and has $20 to spend. One (we'll call it Plan A) has a prepaid phone plan that charges 15 cents for each text sent and 10 cents per minute for calls.

**PLAN A =**

TOTAL COST = $0.15 \cdot$ AMT OF TEXTS $+ 0.10$ AMT OF MINS/CALL

$$X = 0.15t + 0.10C$$

But another prepaid phone plan (we'll call it Plan B) charges a flat fee of $15/month, then $0.05 for every text sent OR minute used.

**PLAN B**

$$B = 15 + 0.05m$$

What is the best way to for him to spend $20?

$$20 = 15 + 0.05m$$
$$-15 \quad -15$$
$$5 = 0 + 0.05m$$
$$5 = 0.05m$$
$$\frac{5}{0.05} = \frac{0.05m}{0.05}$$

**m = 100**

min or texts

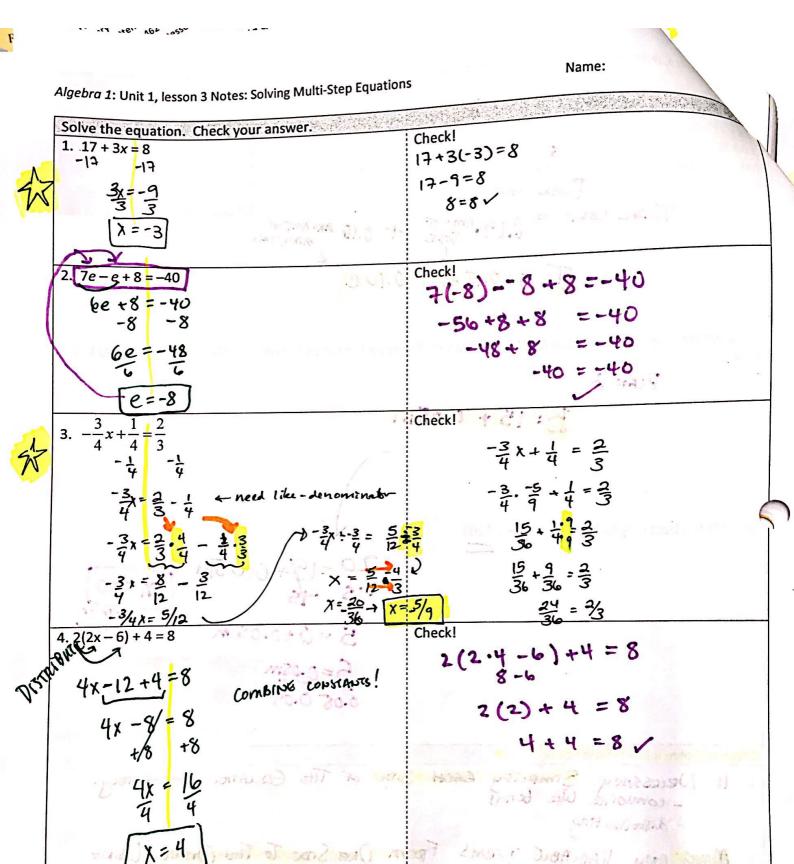## Steps to Solve a Multi-Step Equation

1. IF NECESSARY, SIMPLIFY EACH SIDE OF THE EQUATION SEPARATELY.
   - combine like terms
   - distributing

2. MOVE ANY VARIABLE TERMS FROM ONE SIDE TO THE OTHER USING ADDING / SUBTRACTING (inverse operations).

3. ISOLATE VARIABLE USING INVERSE OPERATIONS PERFORMED ON BOTH SIDES (MULTIPLY / DIVIDE)

Notes 1

*Algebra 1*: Unit 1, lesson 3 Notes: Solving Multi-Step Equations

**Solve the equation. Check your answer.**

---

**1.** $17 + 3x = 8$

$\phantom{17+3x}-17 \qquad -17$

$\dfrac{3x}{3} = \dfrac{-9}{3}$

$\boxed{x = -3}$

**Check!**

$17 + 3(-3) = 8$

$17 - 9 = 8$

$8 = 8 ✓$

---

**2.** $\boxed{7e - e + 8 = -40}$

$6e + 8 = -40$

$\phantom{6e}-8 \qquad -8$

$\dfrac{6e}{6} = \dfrac{-48}{6}$

$\boxed{e = -8}$

**Check!**

$7(-8) - -8 + 8 = -40$

$-56 + 8 + 8 \quad = -40$

$-48 + 8 \quad = -40$

$-40 = -40$

✓

---

**3.** $-\dfrac{3}{4}x + \dfrac{1}{4} = \dfrac{2}{3}$

$\phantom{-\dfrac{3}{4}x}-\dfrac{1}{4} \qquad -\dfrac{1}{4}$

$-\dfrac{3}{4}x = \dfrac{2}{3} - \dfrac{1}{4}$ ← need like-denominator

$-\dfrac{3}{4}x = \dfrac{2}{3} \cdot \dfrac{4}{4} - \dfrac{1}{4} \cdot \dfrac{3}{3}$

$-\dfrac{3}{4}x = \dfrac{8}{12} - \dfrac{3}{12}$

$-3/4\, x = 5/12$

$-\dfrac{3}{4}x \div -\dfrac{3}{4} = \dfrac{5}{12} \div -\dfrac{3}{4}$

$x = \dfrac{5}{12} \cdot \dfrac{4}{-3}$

$x = \dfrac{20}{36} \to \boxed{x = -5/9}$

**Check!**

$-\dfrac{3}{4}x + \dfrac{1}{4} = \dfrac{2}{3}$

$-\dfrac{3}{4} \cdot \dfrac{-5}{9} + \dfrac{1}{4} = \dfrac{2}{3}$

$\dfrac{15}{36} + \dfrac{1}{4} \cdot \dfrac{9}{9} = \dfrac{2}{3}$

$\dfrac{15}{36} + \dfrac{9}{36} = \dfrac{2}{3}$

$\dfrac{24}{36} = \dfrac{2}{3}$

---

**4.** $2(2x - 6) + 4 = 8$ ← DISTRIBUTE

$4x - 12 + 4 = 8$

COMBINE CONSTANTS!

$4x - 8 = 8$

$\phantom{4x}+8 \qquad +8$

$\dfrac{4x}{4} = \dfrac{16}{4}$

$\boxed{x = 4}$

**Check!**

$2(2 \cdot 4 - 6) + 4 = 8$

$\phantom{2(}8 - 6$

$2(2) + 4 = 8$

$4 + 4 = 8 ✓$

---

**5.** In #3 find the value of ~~2y~~ $5x$

$x = -\dfrac{5}{9}$

$5x$

$5 \cdot -\dfrac{5}{9} \to \boxed{-\dfrac{25}{9}}$

**6.** In ~~#4~~ find the value of $e + 3$
#2

$e = -8$

$-8 + 3$

$\boxed{-5}$

**7.** In ~~#2~~ find the value of $9 - 3x$
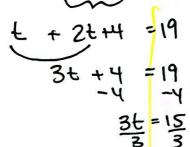
$4 \qquad x = 4 \qquad 9 - 3(4)$

$9 - 12$

$\boxed{-3}$

---

Notes 1-3

Name:

## Word Problem

Tom's sister is four years older than twice his age. The sum of their ages is 19. How old is Tom? How old is his sister?

$$\text{Sister} = 2t + 4$$

$$t = \text{Tom}$$

$$\text{Tom} + \text{Sister} = 19$$

$$t + 2t + 4 = 19$$

$$3t + 4 = 19$$
$$\phantom{3t} - 4 \quad -4$$
$$\frac{3t}{3} = \frac{15}{3}$$
$$t = 5$$

$$\boxed{\text{Sister} = 10 + 4} = 14$$
$$\text{Sister}: 2(5) + 4$$
$$\text{Tom} = 5$$

---

## *Ticket out the Door*

**Your age:** _____ _____'s age: _____

**Knowing the answers of two people's ages write a word problem for your neighbor to solve that when solved they would be able to find your age and** _____**'s age.**