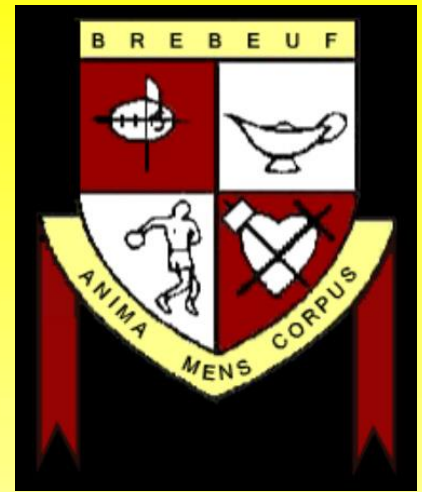


ST. JEAN DE BREBEUF
MATHEMATICS



CHAPTER 4.1

SOLVE ONE and TWO

STEP LINEAR EQUATIONS

CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

KEY CONCEPTS

Equations can be solved in different ways, including flow charts, algebra tiles, and opposite operations.

One way to check the solution to a linear equation is to substitute the solution into the original equation. If the left side and the right side of the equation have the same value, the answer is correct.



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CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 1 Solving One-Step Linear Equations

Solve each of the equations for the variable x and perform a check (where required) to verify your solution.

Leave the variable alone and perform **opposite operations!**

(a) $x + 3 = 5$
 $x = 5 - 3$
 $x = 2$

(b) $x - 7 = -2$
 $x = -2 + 7$
 $x = 5$

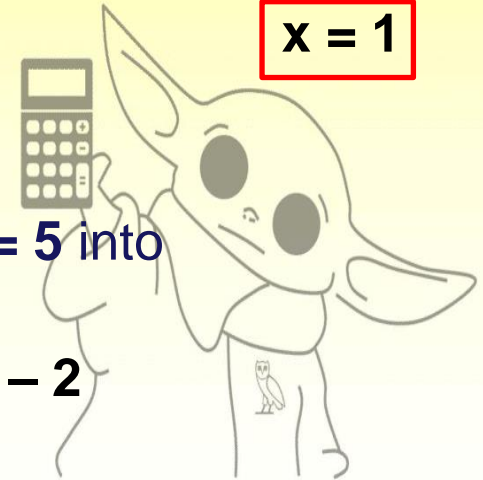
(c) $8 + x = 9$
 $x = 9 - 8$
 $x = 1$

Check: Substitute $x = 2$ into the equation

$$\begin{aligned} \text{LS} &= x + 3 & \text{RS} &= 5 \\ &= 2 + 3 \\ &= 5 \\ &= \text{RS} \end{aligned}$$

Check: Substitute $x = 5$ into the equation

$$\begin{aligned} \text{LS} &= x - 7 & \text{RS} &= -2 \\ &= 5 - 7 \\ &= -2 \\ &= \text{RS} \end{aligned}$$



CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 1 Solving One-Step Linear Equations

Solve each of the equations for the variable x and perform a check (where required) to verify your solution.

Leave the variable alone and perform **opposite operations!**

Divide both sides by the *co-efficient* (number attached to the variable)

$$(d) \quad \frac{\cancel{5}x = 40}{\cancel{5} \quad 5}$$

$$\boxed{x = 8}$$

Check: Substitute $x = 8$ into equation

$$\begin{aligned} \text{LS} &= 5x & \text{RS} &= 40 \\ &= 5(8) \\ &= 40 \\ &= \text{RS} \end{aligned}$$

$$(e) \quad \frac{\cancel{-7}x = 28}{\cancel{-7} \quad -7}$$

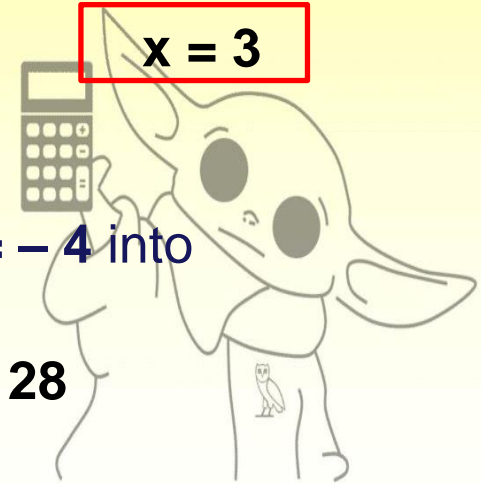
$$\boxed{x = -4}$$

Check: Substitute $x = -4$ into equation

$$\begin{aligned} \text{LS} &= -7x & \text{RS} &= 28 \\ &= -7(-4) \\ &= 28 \\ &= \text{RS} \end{aligned}$$

$$(f) \quad \frac{\cancel{-9}x = -27}{\cancel{-9} \quad -9}$$

$$\boxed{x = 3}$$



CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 1 Solving One-Step Linear Equations

Solve each of the equations for the variable x and perform a check (where required) to verify your solution.

Leave the variable alone and perform **opposite operations!**

Multiply both sides by the *denominator* (bottom number)

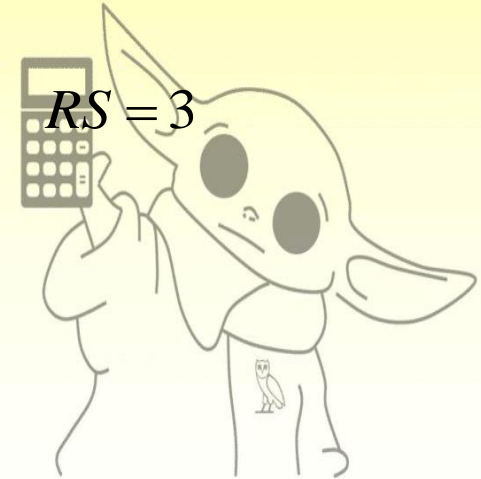
(g) $\frac{x}{6} = 3$

$\cancel{6} \left(\frac{x}{\cancel{6}} \right) = 6(3)$ **Multiply** both sides by **6**

$x = 18$

Check: Substitute $x = 18$ into the equation

$$\begin{aligned} LS &= \frac{x}{6} \\ &= \frac{18}{6} \\ &= 3 \\ &= RS \end{aligned}$$



CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 1 Solving One-Step Linear Equations

Solve each of the equations for the variable x and perform a check (where required) to verify your solution.

Leave the variable alone and perform **opposite operations!**

Multiply both sides by the *denominator* (bottom number)

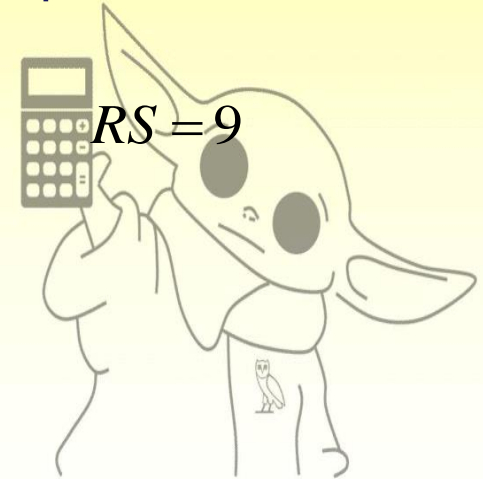
$$(h) \quad \frac{x}{-5} = 9$$

$$\cancel{-5} \left(\frac{x}{\cancel{-5}} \right) = -5(9) \quad \text{Multiply both sides by } -5$$

$$x = -45$$

Check: Substitute $x = -45$ into the equation

$$\begin{aligned} LS &= \frac{x}{-5} \\ &+ \frac{-45}{-5} \\ &= 9 \\ &= RS \end{aligned}$$



CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 1 Solving One-Step Linear Equations

Solve each of the equations for the variable x and perform a check (where required) to verify your solution.

Leave the variable alone and perform **opposite operations!**

Multiply both sides by the *denominator* (bottom number)

$$(i) \quad \frac{x}{-2} = -11$$

$$\cancel{-2} \left(\frac{x}{\cancel{-2}} \right) = -2(-11) \quad \text{Multiply both sides by } -2$$

$$x = 22$$



CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 2 Solving Two-Step Linear Equations

Solve each of the equations for the variable x and perform a check (where required) to verify your solution.

Leave the variable alone and perform **opposite operations!**

(a) $3x - 5 = 7$

$$3x = 7 + 5$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$

$$x = 4$$

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

$$2x = -1 - 3$$

$$\frac{2x}{2} = \frac{-4}{2}$$

$$x = -2$$

$$x = -2$$

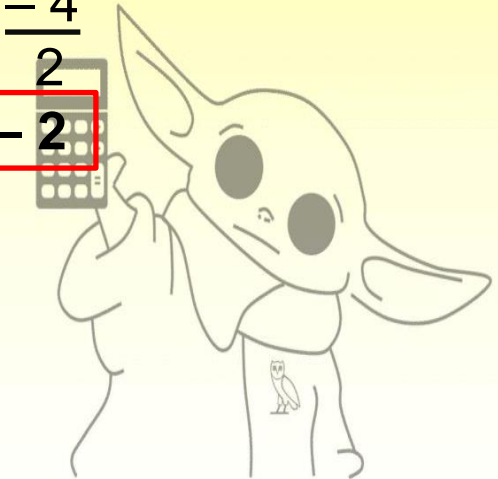
Check: Substitute $x = 4$ into the equation

$$LS = 3x - 5 \quad RS = 7$$

$$= 3(4) - 5$$

$$= 7$$

$$= RS$$



CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 2 Solving Two-Step Linear Equations

Solve each of the equations for the variable x and perform a check (where required) to verify your solution.

Leave the variable alone and perform **opposite operations!**

(c) $5 + \frac{x}{4} = 10$

$$\frac{x}{4} = 10 - 5$$

$$\frac{x}{4} = 5$$

$$4\left(\frac{x}{4}\right) = 4(5)$$

$$x = 20$$

Multiply both sides by **4**

Check: Substitute $x = 20$ into the equation

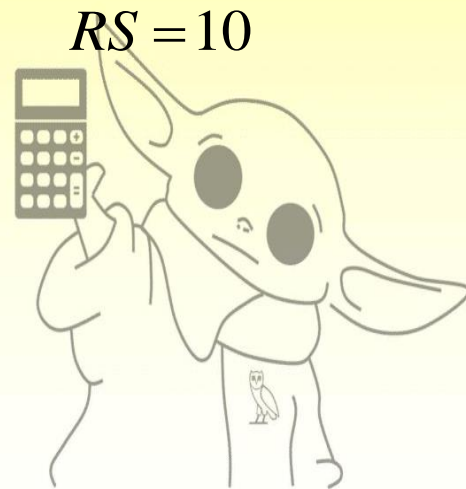
$$LS = 5 + \frac{x}{4}$$

$$= 5 + \frac{20}{4}$$

$$= 5 + 5$$

$$= 10$$

$$= RS$$



CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 2 Solving Two-Step Linear Equations

Solve each of the equations for the variable x and perform a check (where required) to verify your solution.

Leave the variable alone and perform **opposite operations!**

(d) $\frac{3x}{5} = 12$

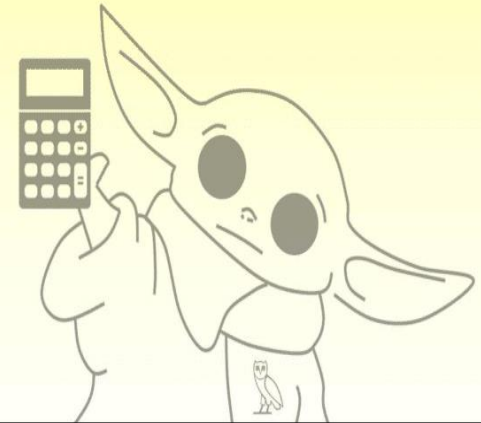
$\cancel{5}\left(\frac{3x}{\cancel{5}}\right) = 5(12)$

Multiply both sides by **5**

$\frac{\cancel{3}x}{\cancel{3}} = \frac{60}{3}$

Divide both sides by **3**

$x = 20$



END OF DAY 1

CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 3 *Application: Recording Studio Costs*

A recording studio charges **according** to the equation $C = 35h + 275$, where “**C**” represents the **total cost** and “**h**” represents the **number of hours** used to use the recording studio.



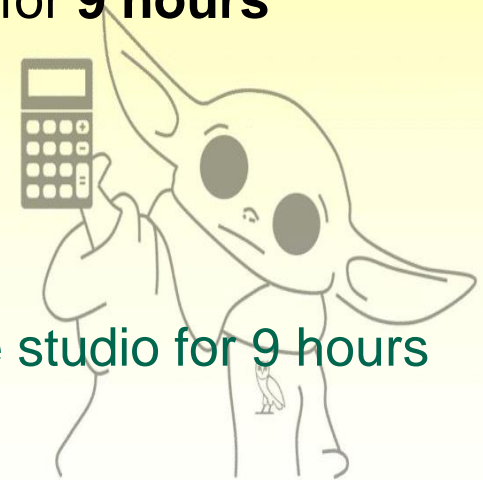
Use the equation to answer the following questions:

(a) Calculate the **total cost** if a singer uses the studio for **9 hours**

Substitute $h = 9$ and solve for C

$$\begin{aligned} C &= 35h + 275 \\ &= 35(9) + 275 \\ &= \mathbf{\$590} \end{aligned}$$

The total cost to use the studio for 9 hours is **\$590**



CHAPTER 4.1

SOLVE ONE and TWO STEP LINEAR EQUATIONS

EXAMPLE 3 Application: Recording Studio Costs

A recording studio charges **according** to the equation $C = 35h + 275$, where “**C**” represents the **total cost** and “**h**” represents the **number of hours** used to use the recording studio.



Use the equation to answer the following questions:

(b) If the **total cost** to use the studio is **\$800**, how many hours would the singer be using?

Substitute $C = 800$ and solve for h

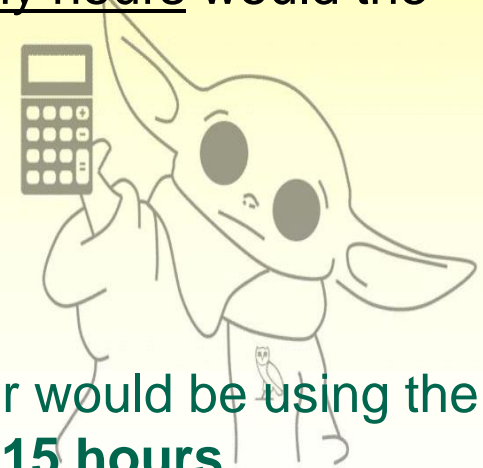
$$C = 35h + 275$$

$$800 = 35h + 275$$

$$800 - 275 = 35h$$

$$\frac{525}{35} = \frac{35h}{35}$$

$$15 = h$$



The singer would be using the studio for **15 hours**.

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SOLVE ONE and TWO STEP LINEAR EQUATIONS

Homework:

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