

# 1.2

## Notetaking with Vocabulary

Learning target: Understand solving linear equations.

Success criteria: I can solve multi-step equations.

Write the meaning of each vocabulary term.

inverse operations

Use the Distributive Prop. ? Def'n of

$$\frac{3}{4}(x+7) = 21 \quad \frac{4}{3} \cdot \frac{3}{4} (x+7) = \frac{21}{1} \cdot \frac{4}{3}$$

$$\frac{3}{4}x + \frac{21}{4} = 21 \quad x+7 = 28$$

$$-\frac{21}{4} \quad -\frac{21}{4} \quad x = 21$$

$$\frac{3}{4}x = \frac{84}{4} - \frac{21}{4}$$

mean - the sum of a numerical data set divided by the number of data values

### Core Concepts

#### Solving Multi-Step Equations

To solve a multi-step equation, simplify each side of the equation, if necessary. Then use inverse operations to isolate the variable.

Notes: Solve the following equations.

1.  $5z - 13 = -3$

$$+13 \quad +13 \quad \text{Add. Prop. of } =$$

$$\frac{5z}{5} = \frac{10}{5} \quad \text{Div. Prop. of } =$$

$$\boxed{z = 2}$$

simplify then solve

2.  $15 = 2 + 4 - d$

$$15 = 6 - d$$

$$-6 \quad -6$$

$$9 = -d$$

$$\frac{9}{-1} = \frac{-d}{-1}$$

$$\boxed{-9 = d}$$

Check

$$15 \stackrel{?}{=} 2 + 4 - (-9) \quad 9 = -d$$

$$15 \stackrel{?}{=} 6 + 9 \quad \frac{9}{-1} = \frac{-d}{-1}$$

$$15 = 15 \checkmark \quad -9 = d$$

$$15 = 6 - d$$

$$+d \quad +d$$

$$15 + d = 6$$

$$-15 \quad -15$$

$$d = -9$$

$$15 = 6 - d$$

$$15 = -d + 6$$

$$-6 \quad -6$$

$$9 = -d$$

$$\frac{9}{-1} = \frac{-d}{-1}$$

$$-9 = d$$

3.  $\frac{f}{4} - 5 = -9$

+5 +5 Add Prop of =

4.  $\frac{f}{4} = -4 \cdot 4$  Mult. Prop. of =

$$\boxed{f = -16}$$

4.  $9z - 5 - 4z = -5$

$$5z - 5 = -5$$

$$+5 \quad +5$$

$$\frac{5z}{5} = \frac{0}{5}$$

$$z = 0$$

Check

$$9(0) - 5 - 4(0) \stackrel{?}{=} -5$$

$$0 - 5 - 0 = -5$$

$$-5 = -5 \checkmark$$

5.  $3(z+7) = 21$

$3z + 21 = 21$  Distributive Prop.  
 $-21 \quad -21$  Sub. Prop. of Eq.

$$\frac{3z}{3} = \frac{0}{3} \quad \text{Div. Prop. of Eq.}$$

$$\boxed{z = 0}$$

6.  $33 = 12r - 3(9-r)$

$$33 = 12r - 27 + 3r$$

$$33 = 15r - 27$$

$$+27 \quad +27$$

$$\frac{60}{15} = \frac{15r}{15}$$

Check

$$33 \stackrel{?}{=} 12(4) - 3(9-4)$$

$$33 = 12(4) - 3(5)$$

$$33 = 48 - 15$$

$$33 = 33 \checkmark$$

(see above for extra example)

$$\boxed{4 = r}$$

## 1.2

## Notetaking with Vocabulary (continued)

7. You can represent an odd integer with the expression  $2n + 1$ , where  $n$  is any integer. Write and solve an equation to find three consecutive odd integers that have a sum of 63.

1<sup>st</sup> odd

2<sup>nd</sup>

3<sup>rd</sup>

$$2n + 1$$

$$2n + 3$$

$$2n + 5$$

$$2n + 1 + 2n + 3 + 2n + 5 = 63$$

$$2(9) + 1$$

19

21

23

$$6n + 9 = 63$$

$$\frac{6n}{6} = \frac{54}{6}$$

$$n = 9$$

## Extra Practice

In Exercises 1–8, solve the equation. Check your solution for two problems.

1.  $3x + 4 = 19$

2.  $17 = z - (-9)$

3.  $\frac{q + (-5)}{3} = 8$

4.  $5x + 3x = 28$

5.  $5z - 2z - 4 = -7$

6.  $12x + 4 + 2x = 39$

$$7. -4(z - 12) = 42$$

$$8. 7 + 3(2g - 6) = -29$$

9. One angle of a triangle has a measure of  $66^\circ$ . The measure of the third angle is  $57^\circ$  more than  $\frac{1}{2}$  the measure of the second angle. The sum of the angle measures of a triangle is  $180^\circ$ .  
What is the measure of the second angle? What is the measure of the third angle?

**Modeling with mathematics** (including using <sup>dimensional</sup> unit analysis - to solve problems with different units)

1. Use the table to find the number of miles  $x$  you need to bike on Friday so that the mean number of miles biked per day is 5.

| Day       | Miles |
|-----------|-------|
| Monday    | 3.5   |
| Tuesday   | 5.5   |
| Wednesday | 0     |
| Thursday  | 5     |
| Friday    | $x$   |

$$\frac{3.5 + 5.5 + 0 + 5 + x}{5} = 5$$

$$\cancel{5} \cdot \frac{14 + x}{\cancel{5}} = 5 \cdot 5$$

$$14 + x = 25$$

$$-14 \quad -14$$

$$x = 11$$

You need to bike 11 miles on Friday.

2. Your school's drama club charges \$4 per person for admission to a play. The club borrowed \$400 to pay for costumes and props. After paying back the loan, the club has a profit of \$100. How many people attended the play?

$x = \#$  of people attending

$$\frac{\$4}{\text{people}} \cdot \frac{x \text{ people}}{1} - \$400 = \$100$$

$$4x - 400 = 100$$

$$4x = 500$$

$$x = 125$$

125 people attended the play.