

Bell Work

A picture frame originally priced at \$14.00 is 40% off.

a) What is the discounted price?

b) What is the final price if 10% sales tax is added after the discount?

**Lesson 2.8 (Literal Equations
and Dimensional Analysis)**

Objectives:

-Solve equations for given variables.

-Use formulas to solve real-world problems.

Solve for Specific Variables

Literal Equation (Formula) - equation involving several variables

Ex. 1

Solve $4m - 3n = 8$ for m .

$$4m - 3n = 8$$

$$4m - 3n + 3n = 8 + 3n$$

$$4m = 8 + 3n$$

$$\frac{4m}{4} = \frac{8 + 3n}{4}$$

$$m = \frac{8}{4} + \frac{3}{4}n$$

$$m = 2 + \frac{3}{4}n$$

Ex. 2

Solve $3x - 2y = xz + 5$ for x .

$$3x - 2y = xz + 5$$

$$3x - 2y + 2y = xz + 5 + 2y$$

$$3x - xz = xz - xz + 5 + 2y$$

$$3x - xz = 5 + 2y$$

$$x(3 - z) = 5 + 2y$$

$$\frac{x(3 - z)}{3 - z} = \frac{5 + 2y}{3 - z}$$

$$x = \frac{5 + 2y}{3 - z}$$

When the variable is on both sides:

1. Move the variable to one side.
2. Isolate the variable using distribution.

Practice

1A. $15 = 3n + 6p$, for n

1B. $\frac{k-2}{5} = 11j$, for k

1C. $28 = t(r + 4)$, for t

1D. $a(q - 8) = 23$, for q

2A. $d + 5c = 3d - 1$, for d

2B. $6q - 18 = qr + t$, for q

Dimensional (Unit) Analysis -

process of carrying units
throughout a computation

Example: A race is 10 km long. If 1 meter = 1.094 yards, find the length of the race in miles. (Hint: 1 mi = 1760 yd)

$$\begin{array}{ccccccc}
 \text{length} & & & & & & \\
 \text{of run} & \times & \text{kilometers} & \times & \text{meters} & \times & \text{yards} \\
 & & \text{to meters} & & \text{to yards} & & \text{to miles} \\
 10 \text{ km} & \times & \frac{1000 \text{ m}}{1 \text{ km}} & \times & \frac{1.094 \text{ yd}}{1 \text{ m}} & \times & \frac{1 \text{ mi}}{1760 \text{ yd}}
 \end{array}$$

Notice how the units cancel, leaving the unit to which you are converting.

$$10 \cancel{\text{ km}} \times \frac{1000 \cancel{\text{ m}}}{1 \cancel{\text{ km}}} \times \frac{1.094 \cancel{\text{ yd}}}{1 \cancel{\text{ m}}} \times \frac{1 \text{ mi}}{1760 \cancel{\text{ yd}}} = \frac{10,940 \text{ mi}}{1760} \approx 6.2 \text{ mi}$$

A 10K race is approximately 6.2 miles.

Practice: A car travels 100 feet in 2.8 seconds. What is the velocity of the car in miles per hour?

Homework

Lesson 2.8 (Page 128-129)

#