Name _____ Class _____ Date _____

Reteaching 6-4

Applications of Linear Systems

OBJECTIVE: Writing and solving systems of linear equations

MATERIALS: Graph paper

As you solve multi-step systems of linear equations, remember these strategies:

- Determine which form each equation is in:

  $Ax + By = C$ or $y = mx + b$
- If the equations are in the form $Ax + By = C$ and a variable can easily be eliminated, use elimination.
- If the equations are in $y = mx + b$ form, use graphing or substitution.

Example

Last year, Zach received \$469.75 in interest from two investments. The interest rates were 7.5% on one account and 8% on the other. If the total amount invested was \$6000, how much was invested at each rate?

Define x = investment in first account; y = investment in second account

Relate The total amount invested was \$6000.

Write

$$x + y = 6000$$ ← **Determine the form of each equation: $Ax + By = C$**

$$0.075x + 0.08y = 469.75$$

$$y = -x + 6000$$ ← **Since a variable cannot easily be eliminated, rewrite one equation in the form $y = mx + b$.**

$$0.075x + 0.08(-x + 6000) = 469.75$$ ← **Substitute $-x + 6000$ for y.**

$$-0.005x = -10.25$$ ← **Solve for x.**

$$x = 2050$$

$$2050 + y = 6000$$ ← **Substitute 2050 for x in the first equation and solve for y.**

$$y = 3950$$

The amount invested in the first account was \$2050. The amount invested in the second account was \$3950.

Exercises

Model with a system of equations and solve using elimination, substitution, and graphing. Explain which is the best method, and why.

1. Mary ordered lunch for herself and several co-workers on Monday and Tuesday. On Monday, she paid \$7 for five sandwiches and four sodas. On Tuesday, she paid \$6 for four of each. Find the price of a sandwich and the price of a soda.

2. A local landscape company had a one-week sale. On Monday, Mrs. Jones had \$82 to spend. After purchasing 5 trees, she had just enough money left to purchase 1 shrub. Later in that same week, she purchased 2 trees. She had \$37 with her, so she again had enough money left to purchase 1 shrub. Find the cost of a tree and the cost of a shrub.

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