1. Kevin invested part of his $10,000 bonus in a certificate of deposit that paid 6% annual simple interest, and the remainder in a mutual fund that paid 11% annual simple interest. If his total interest for that year was $700, how much did Kevin invest in the mutual fund?

2. How can $70,000 be invested, part at 4% annual simple interest and the remainder at 10% annual simple interest, so that the interest earned by the two accounts is equal at the end of the year?

3. Melissa invested a sum of money at 3% annual simple interest. She invested three times that sum at 5% annual simple interest. If her total yearly interest from both investments was $5400, how much was invested at 3%?

4. A college student earned $8800 during summer vacation working as a waiter in a popular restaurant. The student invested part of the money at 7% and the rest at 6%. If the student received a total of $560 in interest at the end of the year, how much was invested at 7%?

5. How much pure acid should be mixed with 7 gallons of a 50% acid solution in order to get an 80% acid solution?

6. A chemist needs 4 liters of a 50% salt solution. All she has available is a 20% salt solution and a 70% salt solution. How many liters of each of the two solutions should she mix to obtain her desired solution?

7. The radiator in a certain make of car needs to contain 40 liters of 40% antifreeze. The radiator now contains 40 liters of 20% antifreeze. How many liters of this solution must be drained and replaced with 100% antifreeze to get the desired strength?

8. The manager of a candy shop sells chocolate peanuts for $8 per pound and chocolate covered cashews for $14 per pound. The manager wishes to mix 50 pounds of the cashews to get a cashew-peanut mixture that will sell for $9 per pound. How many pounds of peanuts should be used?

9. A motorcycle traveling at 60 miles per hour overtakes a car traveling at 30 miles per hour that had a three-hour head start. How far from the starting point are the two vehicles?

10. Jeff starts driving at 55 miles per hour from the same point that Lauren starts driving at 60 miles per hour. They drive in opposite directions, and Lauren has a half-hour head start. How long will they be able to talk on their cell phones that have a 300-mile range?

11. Tom deposits $500 in a savings account at his bank. The bank pays 5% interest. How much interest will Tom earn?

12. Two cyclists start from the same point and travel in opposite directions. One cyclist averages 12 miles per hour. After how long will they be 36 miles apart?

13. A car traveled at an average rate of 59 miles per hour and then reduced its speed to 41 miles per hour for the rest of the trip. If the trip took 3 hours, determine how long the car traveled at each rate.

14. A rental car company that rents cars for local-only use charges $50 plus $0.20 for each mile the rental car is driven. If a customer gives the rental attendant $100 for a charge of $64, how many miles did the customer drive?
Skill Builder 3.1
An Introduction to Problem Solving

Complete the charts below and solve the problems outlined.

1. You invest $10,000 in two separate accounts. One pays 5% annual interest and the other 8% per year. If the total interest for the first year is $710, determine how much money was invested at each rate.

<table>
<thead>
<tr>
<th>Principal</th>
<th>x</th>
<th>Rate</th>
<th>=</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>5% investment</td>
<td>x</td>
<td>0.05</td>
<td>a.</td>
<td></td>
</tr>
<tr>
<td>8% investment</td>
<td>(10,000 - x)</td>
<td>0.08</td>
<td>b.</td>
<td></td>
</tr>
</tbody>
</table>

Interest from 5% investment plus Interest from 8% investment is first year’s interest

c. .................................. + d. .................................. = e. ..................................

\[ \frac{x}{5\%} + \frac{10,000 - x}{8\%} = 710\]

2. A 60 milliliter solution of ammonia in water is 20% ammonia. How much ammonia is in the solution?

Amount of ammonia in the solution is percent of total milliliters in solution.

\[ \frac{20\%}{60 \text{ ml}} = \frac{\text{Amount}}{60 \text{ ml}} \]

3. Two planes leave from the same airport at the same time flying in opposite directions. One plane flies at 325 miles per hour and the other at 250 miles per hour. After how many hours will the planes be 1725 miles apart?

<table>
<thead>
<tr>
<th>Rate</th>
<th>x</th>
<th>Time</th>
<th>=</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faster plane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slower plane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Distance faster plane plus Distance slower plane equals total distance

\[ \text{Distance} = \frac{325\text{ mph}}{60\text{ mph}} \times \text{Time} + \frac{250\text{ mph}}{60\text{ mph}} \times \text{Time} \]

It will take _______ hours for the planes to be 1725 miles apart.

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