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>Rate</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>5% investment</td>
<td>x</td>
<td>0.05</td>
</tr>
<tr>
<td>8% investment</td>
<td>(10,000 – x)</td>
<td>0.08</td>
</tr>
</tbody>
</table>

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

c. ___________________ + d. ___________________ = e. _______________

\[
x = \frac{710}{0.05} = 14,200 @ 5\
$10,000 – x = \frac{710}{0.08} = 8,875 @ 8%
\]

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.

\[
\frac{60}{100} \times 20 = 12
\]

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

_________________ + ___________________ = ___________

It will take _________ hours for the planes to be 1725 miles apart.
Skill Builder 3.2
Ratio and Proportion

A ratio compares two quantities.
A proportion is a statement that two ratios are equal.

One hundred men and one hundred women were surveyed about their favorite colors. Use ratios to show the comparisons.

Compare using ratios: (Reduce to lowest terms if possible)

1. Men to Women preferring red.
2. Women to Men preferring yellow.
3. Men preferring green to total people surveyed.
4. Women to Men that like pink.
5. Women preferring blue to total surveyed preferring blue.

Determine whether each of the following is a proportion by using cross products.

6. \( \frac{8}{9} = \frac{20}{22} \)
7. \( \frac{15}{16} = \frac{180}{192} \)

Solve each proportion.

8. \( \frac{x}{5} = \frac{105}{75} \)

9. \( \frac{4.2}{a} = \frac{8}{5} \)

10. \( \frac{18}{30} = \frac{y}{4} \)
Skill Builder 3.3
Problem Solving in Geometry

Solve each of the following geometry problems. Given answers in π form, when applicable, then round to the nearest unit, square unit or cubic unit.

1. Given a right triangle with legs measuring 6 inches and 8 inches and the hypotenuse is 10 inches.
   Calculate the perimeter = _______________ and area = _______________

2. Given a circle with a radius of 5 feet.
   Calculate the circumference = _______________ and area = _______________

3. Given a cylinder with the radius of the base is 3 cm and the height is 5 cm.
   Calculate the area = _______________

4. Given a sphere with a radius of 4 m.
   Calculate the volume = _______________

5. Given a triangle with angles measuring \(x\), \(2x\), and \(x + 8\).
   Calculate the measure of all 3 angles.
   _______________ _______________ _______________

6. Given 2 angles that are complementary. One measures \(x\) and the other \(2x + 3\).
   Calculate the measure of both angles.
   _______________ _______________

7. Given 2 angles that are supplementary. One measures \(x\) and the other \(3x + 4\).
   Calculate the measure of both angles.
   _______________ _______________