LESSON

## 79   Finding Equivalent Fractions by Multiplying by 1

WARM-UP

Facts Practice: 60 Improper Fractions to Simplify (Test H)

Mental Math:

a. How many centimeters are in one meter? How many meters are in one kilometer? Hold two fingers one centimeter apart. Hold your hands one yard apart.

b. $\frac{1}{4}$ of 20   c. $\frac{1}{4}$ of 200   d. $\frac{1}{5}$ of 16

e. 10% of $5.00   f. $\sqrt{49}, -2, \div 2, -2$

Problem Solving:

Draw a triangle that is similar to this triangle with sides that are twice as long.

$\frac{3}{4}$ in.

1 in.
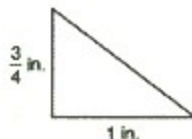
NEW CONCEPT

In Lesson 15 we learned that when a number is multiplied by 1, the value of the number does not change. This property is called the **identity property of multiplication.** We can use this property to find **equivalent fractions.** Equivalent fractions are different names for the same number. For example, $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}$, and $\frac{4}{8}$ are equivalent fractions. To find equivalent fractions, we multiply a number by different fraction names for 1.

$$\frac{1}{2} \times \frac{2}{2} = \frac{2}{4} \quad\quad \frac{1}{2} \times \frac{3}{3} = \frac{3}{6} \quad\quad \frac{1}{2} \times \frac{4}{4} = \frac{4}{8}$$

As we see above, we can find fractions equivalent to $\frac{1}{2}$ by multiplying by $\frac{2}{2}, \frac{3}{3}$, and $\frac{4}{4}$. By multiplying $\frac{1}{2}$ by $\frac{5}{5}, \frac{6}{6}, \frac{7}{7}$, and so on, we find more fractions equivalent to $\frac{1}{2}$:

$$\frac{1}{2} \times \frac{n}{n} = \frac{5}{10}, \frac{6}{12}, \frac{7}{14}, \frac{8}{16}, \frac{9}{18}, \frac{10}{20}, \dots$$

LESSON PRACTICE

Practice set*   Find the fraction name for 1 used to make each equivalent fraction:

a. $\dfrac{3}{4} \times \dfrac{?}{?} = \dfrac{9}{12}$ b. $\dfrac{2}{3} \times \dfrac{?}{?} = \dfrac{4}{6}$

c. $\dfrac{1}{3} \times \dfrac{?}{?} = \dfrac{4}{12}$ d. $\dfrac{1}{4} \times \dfrac{?}{?} = \dfrac{25}{100}$

Find the numerator that completes each equivalent fraction:

e. $\dfrac{1}{3} = \dfrac{?}{9}$ f. $\dfrac{2}{3} = \dfrac{?}{15}$ g. $\dfrac{3}{5} = \dfrac{?}{10}$

h. Write a fraction equal to $\frac{1}{2}$ that has a denominator of 6. Then write a fraction equal to $\frac{1}{3}$ that has a denominator of 6. What is the sum of the two fractions you made?

i. Write $\frac{3}{5}$ as a fraction with a denominator of 100. Then write that fraction as a percent.

MIXED PRACTICE

Problem set   **1.** Mr. MacDonald bought 1 ton of hay for his cow,
(21, 77)   Geraldine. Every day Geraldine eats 50 pounds of hay. At this rate 1 ton of hay will last how many days?

2. A platypus is a mammal with a duck-like bill and webbed
(23, 74)   feet. A platypus is about $1\frac{1}{2}$ feet long. One and one half feet is how many inches?

3. Sam bought 3 shovels for his hardware store for $6.30
(49)   each. He sold them for $10.95 each. How much profit did Sam make on all 3 shovels? (Sam's profit for each shovel can be found by subtracting how much Sam paid from the selling price.)

4. Add the decimal number ten and fifteen hundredths to
(68, 73)   twenty-nine and eighty-nine hundredths. Use words to name the sum.