

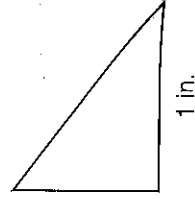
Finding Equivalent Fractions by Multiplying by 1

Facts Practice: Simplify 60 Improper Fractions (Test H in Test Masters).

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

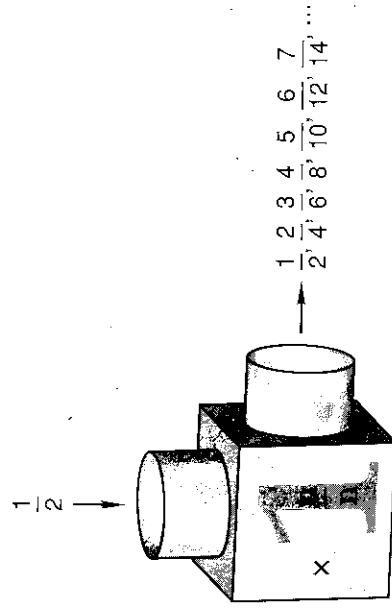
- a. CCL b. CCXLIX c. $\frac{1}{5}$ of 16
 d. 10% of \$5.00 e. $\sqrt{49}$, -2 , $\div 2$, -2

Problem Solving: Draw a triangle that is similar to this triangle $\frac{3}{4}$ in. with sides that are twice as long.



The same fraction may be named many different ways. The fractions $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{4}{8}$ all name the same number. They are equivalent fractions.

In this lesson we will practice a method for making equivalent fractions. To make equivalent fractions we will use the name-changer machine.



Name-Changer Machine

The name-changer machine takes a fraction and multiplies it by a fraction name for 1. We know that when we multiply a number by 1, the size of the number is not

changed. However, if we multiply a number by a fraction that is equal to 1, the answer will be a different name for the same number.

$\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$	$\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$	$\frac{1}{2} \times \frac{4}{4} = \frac{4}{8}$
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The fractions $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, and $\frac{4}{8}$ are equivalent fractions. They were formed by multiplying $\frac{1}{2}$ by different fraction names for 1.

Example 1 By what name for 1 should $\frac{3}{4}$ be multiplied to make $\frac{6}{8}$?

$$\frac{3}{4} \times \frac{?}{?} = \frac{6}{8}$$

Solution To change the name of $\frac{3}{4}$ to $\frac{6}{8}$, we multiply by $\frac{2}{2}$. The fraction $\frac{2}{2}$ is equal to 1, and when we multiply by 1 we do not change the value of the number. Therefore, $\frac{3}{4} = \frac{6}{8}$. The fractions are equivalent.

Example 2 Write a fraction equal to $\frac{2}{3}$ that has a denominator of 12.

Solution We may change the name of a fraction by multiplying by a fraction name for 1. To make the 3 a 12, we must multiply by 4. So the fraction name for 1 which we will use is $\frac{4}{4}$. We multiply $\frac{2}{3} \times \frac{4}{4}$ to make the equivalent fraction $\frac{8}{12}$.

Example 3 Write a fraction equal to $\frac{1}{3}$ that has a denominator of 12. Also, write a fraction equal to $\frac{1}{4}$ that has a denominator of 12. Then add the two fractions you made. What is the sum?

Solution We multiply $\frac{1}{3}$ by $\frac{4}{4}$ and $\frac{1}{4}$ by $\frac{3}{3}$.

$$\frac{1}{3} \times \frac{4}{4} = \frac{4}{12} \quad \frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$$

Then we add $\frac{4}{12}$ and $\frac{3}{12}$.

$$\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$

Practice* What name for 1 is used to make these equivalent fractions?

a. $\frac{3}{4} \times \frac{?}{?} = \frac{9}{12}$

b. $\frac{2}{3} \times \frac{?}{?} = \frac{4}{6}$

c. $\frac{1}{3} \times \frac{?}{?} = \frac{4}{12}$

Find the numerator to complete the equivalent fractions:

d. $\frac{1}{3} = \frac{?}{9}$

e. $\frac{2}{3} = \frac{?}{15}$

f. $\frac{3}{5} = \frac{?}{10}$

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

Problem set 89

- Mr. MacDonald bought 1 ton of hay for his cow, Geraldine. Every day Geraldine ate 50 pounds of hay. At this rate, 1 ton of hay will last how many days?
- A platypus is a mammal with a ducklike bill and webbed feet. A platypus is about $1\frac{1}{2}$ feet long. One and one half feet is how many inches?
- Sam bought 3 shovels for his hardware store for \$6.30 each. He sold them for \$10.95 each. How much profit did Sam make on all 3 shovels?

4. Add the decimal to twenty-nine and eighty-nine hundredths. Use words to name the sum.

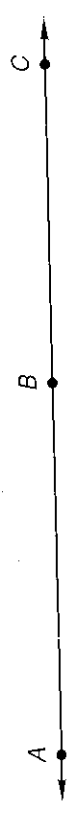
5. By what name for 1 should $\frac{2}{3}$ be multiplied to make $\frac{6}{9}$? $\frac{2}{3} \times \frac{?}{?} = \frac{6}{9}$

6. Draw a rectangle that has all sides the same length.

7. List the numbers that are factors of both 9 and 12.

8. Write a fraction equal to $\frac{3}{4}$ that has a denominator of 12. Also, write a fraction equal to $\frac{2}{3}$ that has a denominator of 12. Then add the fractions you wrote. What is the sum?

9. AC is 9.1 centimeters. BC is 4.2 centimeters. Find AB.



10. $1\frac{1}{5} + 2\frac{2}{5} + 3\frac{3}{5}$

11. $5 - \left(3\frac{5}{8} - 3\right)$

12. \$10 - 10¢

13. \$10 ÷ 4

14. $9 \times 64¢ = \$$ _____

15. $9863.2 - 7775.46 + 897.5$

16. $30.10 - 21.73$

17. 408×748

18. $7 \overline{)43,859}$

19. $\frac{6552}{9}$

20. $80 \overline{)4137}$

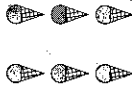
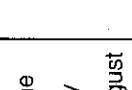
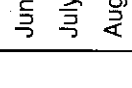

21. $\frac{1}{2}$ of $\frac{1}{5}$

22. $\frac{3}{4} \times \frac{2}{2}$

23. $\frac{3}{5} \times \frac{5}{4}$

This graph shows the number of ice-cream cones sold the snack bar. Use the information in the graph to answer questions 24 and 25.

Ice-Cream Cone Sales

MONTH	NUMBER OF CONES SOLD
June	
July	
August	
 = 100 cones	

24. The number of cones sold in July was how many?

- (54) A. $3\frac{1}{2}$ B. 300 C. 305 D. 350

25. Altogether, how many cones were sold during June, July, and August?

(54)

LESSON 90

Identifying Prime Numbers

Facts Practice: Simplify 60 Improper Fractions (Test H in Test Masters)

Mental Math: How many grams equal a kilogram? A pair of shoes is about a kilogram. One shoe is about how many grams?

- a. CXC b. CXCIV c. $\frac{1}{3}$ of 16
 d. 25% of \$20.00 e. $\sqrt{81}$, -2 , $\div 2$, -1 , $\times 2$, -5

Problem Solving: Find the next three numbers in this sequence.
 1, 1, 2, 3, 5, 8, 13, —, —, —, ...