

Name _____

Date _____

Simplifying Fractions

FACTORS AND FRACTIONS

To convert a fraction to its simplest terms, divide the numerator and denominator by their greatest common factor.

$$\frac{21}{28} \div \frac{7}{7} = \frac{3}{4}$$

Reduce to simplest terms.

$$\textcircled{1} \quad \frac{6}{63} = \frac{2}{21}$$

$$\textcircled{2} \quad \frac{36}{60} = \frac{3}{5}$$

$$\textcircled{3} \quad \frac{8}{20} = \frac{2}{5}$$

$$\textcircled{4} \quad \frac{18}{24} = \frac{3}{4}$$

$$\textcircled{5} \quad \frac{24}{32} = \frac{3}{4}$$

$$\textcircled{6} \quad \frac{12}{16} = \frac{3}{4}$$

$$\textcircled{7} \quad \frac{20}{60} = \frac{1}{3}$$

$$\textcircled{8} \quad \frac{32}{48} = \frac{2}{3}$$

$$\textcircled{9} \quad \frac{9}{54} = \frac{1}{6}$$

$$\textcircled{10} \quad \frac{10}{16} = \frac{5}{8}$$

$$\textcircled{11} \quad \frac{50}{75} = \frac{2}{3}$$

$$\textcircled{12} \quad \frac{18}{32} = \frac{9}{16}$$

$$\textcircled{13} \quad \frac{31}{93} = \frac{1}{3}$$

$$\textcircled{14} \quad \frac{11}{88} = \frac{1}{8}$$

$$\textcircled{15} \quad \frac{32}{96} = \frac{1}{3}$$

$$\textcircled{16} \quad \frac{7}{35} = \frac{1}{5}$$

$$\textcircled{17} \quad \frac{62}{93} = \frac{2}{3}$$

$$\textcircled{18} \quad \frac{45}{99} = \frac{5}{11}$$

$$\textcircled{19} \quad \frac{75}{225} = \frac{1}{3}$$

$$\textcircled{20} \quad \frac{50}{500} = \frac{1}{10}$$

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Simplifying Fractions

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★ Fractions should be reduced to their simplest form. You will find the greatest common factor of both the denominator and numerator and divide each by that number.

For example, to reduce $\frac{25}{40}$ to simplest form:

The factors of 25 are 1, 5, 25.

The factors of 40 are 1, 2, 4, 5, 8, 10, 20.

The greatest common factor is 5. $\frac{25 \div 5 = 5}{40 \div 5 = 8}$

Simplify these fractions. Show your work.

1 $\frac{20}{35} = \frac{4}{7}$

$\frac{16}{30} = \frac{8}{15}$

$\frac{40}{56} = \frac{5}{7}$

2 $\frac{25}{50} = \frac{1}{2}$

$\frac{28}{42} = \frac{2}{3}$

$\frac{8}{20} = \frac{2}{5}$

3 $\frac{48}{64} = \frac{3}{4}$

$\frac{10}{65} = \frac{2}{13}$

$\frac{18}{81} = \frac{2}{9}$

4 $\frac{42}{60} = \frac{7}{10}$

$\frac{15}{45} = \frac{1}{3}$

$\frac{2}{12} = \frac{1}{6}$

5 $\frac{27}{63} = \frac{3}{7}$

$\frac{40}{72} = \frac{5}{9}$

$\frac{14}{70} = \frac{1}{5}$

6 $\frac{36}{144} = \frac{3}{12}$

$\frac{22}{121} = \frac{2}{11}$

$\frac{21}{105} = \frac{1}{5}$

7 $\frac{60}{96} = \frac{5}{8}$

$\frac{96}{156} = \frac{8}{13}$

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

8 $\frac{8}{40} = \frac{1}{5}$

$\frac{40}{120} = \frac{1}{3}$

$\frac{9}{126} = \frac{1}{14}$

9 Explain why $\frac{30}{42}$ is not $\frac{3}{4}$ in simplest form.

$\frac{30}{42} = \frac{5}{7} \neq \frac{3}{4}$

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Least Common Denominator

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★ You will need to find the least common denominator (LCD) of two or more fractions when you are adding or subtracting fractions with unlike denominators. If you wanted to add $\frac{1}{2}$ and $\frac{1}{3}$, you would follow the same steps as finding the least common multiple.

12—12, **24**

8—8, 16, **24**

The least common denominator of these fractions is 24.

Find the least common denominator.

① $\frac{1}{3}, \frac{1}{4}, \frac{1}{2}$ 12

$\frac{1}{5}, \frac{1}{6}, \frac{1}{8}$ 120

$\frac{1}{9}, \frac{1}{10}, \frac{1}{12}$ 180

② $\frac{2}{5}, \frac{1}{3}, \frac{2}{7}$ 105

$\frac{2}{9}, \frac{3}{5}, \frac{5}{6}$ 90

$\frac{3}{10}, \frac{7}{20}, \frac{1}{30}$ **60** sixty

③ $\frac{7}{10}, \frac{4}{15}, \frac{1}{2}$ 30

$\frac{9}{10}, \frac{5}{18}, \frac{19}{20}$ 180

$\frac{4}{5}, \frac{3}{7}, \frac{1}{4}$ 140

④ $\frac{5}{6}, \frac{1}{2}, \frac{4}{7}$

$\frac{1}{2}, \frac{1}{5}, \frac{1}{9}$ 90

$\frac{1}{8}, \frac{11}{15}, \frac{2}{7}$ 840

True or false? If the statement is false, correct it by finding the LCD.

⑤ The LCD of $\frac{1}{2}$ and $\frac{1}{3}$ is 18. T

The LCD of $\frac{1}{3}, \frac{1}{6},$ and $\frac{1}{2}$ is 24. T

⑥ The LCD of $\frac{1}{4}$ and $\frac{1}{9}$ is 36. T

The LCD of $\frac{1}{9}, \frac{1}{6},$ and $\frac{1}{2}$ is 60. F 70

⑦ The LCD of $\frac{1}{3}$ and $\frac{1}{6}$ is 42. F 56

The LCD of $\frac{1}{2}, \frac{1}{3},$ and $\frac{1}{10}$ is 30. T

⑧ The LCD of $\frac{1}{2}$ and $\frac{1}{4}$ is 48. F 12

The LCD of $\frac{1}{3}, \frac{1}{6},$ and $\frac{1}{5}$ is 45 T

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Equivalent Fractions

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- ★ Multiplying or dividing both terms of a fraction by the same number does not change the value of the fraction.

What fraction with a denominator of 8 is equal to $\frac{1}{4}$?

$$\frac{1}{4} = \frac{?}{8}$$

The first step is to determine how many 4s are contained in 8. The answer is 2, so we know that the multiplier for both terms of the fraction is 2.

$$\frac{1}{4} \times \frac{2}{2} = \frac{2}{8}$$

What fraction with a numerator of 12 is equal to $\frac{3}{4}$? Think: What are the factors of 12? Which factor, when multiplied by 3 equals 12?

$$\frac{3}{4} = \frac{12}{?} \quad \frac{3}{4} \times \frac{4}{4} = \frac{12}{16}$$

Change $\frac{8}{20}$ to tenths. To reduce a fraction, divide each term by a common factor.

$$\frac{8}{20} = \frac{?}{10} \quad \frac{8}{20} \div \frac{2}{2} = \frac{4}{10}$$

To reduce a fraction to lowest terms, divide both numerator and denominator by their greatest common factor.

$$\frac{8}{20} = \frac{?}{?} \quad \frac{8}{20} \div \frac{4}{4} = \frac{2}{5}$$

Solve.

$$\textcircled{1} \quad \frac{2}{3} = \frac{?}{6} \quad 4$$

$$\frac{4}{5} = \frac{16}{?} \quad 20$$

$$\frac{3}{4} = \frac{12}{?} \quad 16$$

$$\frac{5}{8} = \frac{?}{16} \quad 10$$

$$\textcircled{2} \quad \frac{8}{64} = \frac{?}{8} \quad 1$$

$$\frac{11}{16} = \frac{33}{?} \quad 48$$

$$\frac{9}{10} = \frac{?}{30} \quad 27$$

$$\frac{6}{15} = \frac{18}{?} \quad 45$$

$$\textcircled{3} \quad \frac{12}{16} = \frac{3}{?} \quad 4$$

$$\frac{20}{30} = \frac{?}{3} \quad 2$$

$$\frac{8}{12} = \frac{?}{3} \quad 2$$

$$\frac{14}{28} = \frac{?}{2} \quad 1$$

Reduce to lowest terms.

$$\textcircled{4} \quad \frac{2}{18} = \frac{1}{9}$$

$$\frac{4}{24} = \frac{1}{6}$$

$$\frac{3}{15} = \frac{1}{5}$$

$$\frac{7}{14} = \frac{1}{2}$$

$$\textcircled{5} \quad \frac{6}{18} = \frac{1}{3}$$

$$\frac{4}{32} = \frac{1}{8}$$

$$\frac{7}{28} = \frac{1}{4}$$

$$\frac{12}{32} = \frac{3}{8}$$