

Date: _____

- 6.4 Notes: Multiplying Improper Fractions and Mixed Numbers

Remember:

An **improper fraction** is a fraction where the numerator is greater than the denominator.

A **mixed number** includes a whole number and a proper fraction.

Multiply:

$$\begin{aligned} \frac{11}{3} \times \frac{3}{2} &= \frac{11 \times 3}{1 \times 2} \\ &= \frac{33}{2} \\ &= 16 \frac{1}{2} \end{aligned}$$

$$\begin{aligned} 1 \frac{1}{4} \times 1 \frac{1}{3} &= \frac{5}{4} \times \frac{4}{3} \\ &= \frac{5 \times 1}{1 \times 3} \\ &= \frac{5}{3} \\ &= 1 \frac{2}{3} \end{aligned}$$

$$\begin{aligned} 2 \frac{1}{4} \times 2 \frac{1}{4} &= \frac{9}{4} \times \frac{9}{4} \\ &= \frac{9 \times 9}{4 \times 4} \\ &= \frac{81}{16} \\ &= 5 \frac{1}{16} \end{aligned} \quad \left\{ \begin{array}{l} 5 \times 16 = 80 \\ 81 - 80 \\ = 1 \end{array} \right.$$

Summary:

When multiplying two mixed numbers:

- ① Convert into improper fraction
- ② Cross-reduce if you can
Multiply the numerators and
multiply the denominators

Calculate:

$$\begin{aligned}2\frac{1}{10} \times 3\frac{1}{2} &= \frac{21}{10} \times \frac{7}{2} \\ &= \frac{21 \times 7}{10 \times 2} \\ &= \frac{147}{20} \\ &= 7\frac{7}{20}\end{aligned}$$

$$\begin{aligned}1\frac{1}{5} \times 3\frac{2}{3} &= \frac{6^2}{5} \times \frac{11}{3} \\ &= \frac{2 \times 11}{5 \times 1} \\ &= \frac{22}{5} \\ &= 4\frac{2}{5}\end{aligned}$$

Word Problems:

Jasmine worked $3\frac{1}{4}$ h a day for five days. How many hours did Jasmine work altogether?

Show your work.

$$\begin{aligned}3\frac{1}{4} \times 5 &= \frac{13}{4} \times 5 \\ &= \frac{13}{4} \times \frac{5}{1} \\ &= \frac{65}{4} \\ &= 16\frac{1}{4}\end{aligned}$$

\therefore Jasmine worked $16\frac{1}{4}$ hours altogether.

During the school year, the swim team practices $2\frac{3}{4}$ h per week. During the summer, the weekly practice time increases to $2\frac{1}{3}$ times the school year practice. How many hours per week does the team practice during the summer? Show your work.

$$2\frac{1}{3} \text{ of } 2\frac{3}{4} \text{ h}$$

$$\begin{aligned}2\frac{1}{3} \times 2\frac{3}{4} \\ &= \frac{7}{3} \times \frac{11}{4} \\ &= \frac{77}{12} \\ &= 6\frac{5}{12}\end{aligned}$$

The team practices $6\frac{5}{12}$ h during the summer.