

2.1 MULTIPLYING FRACTIONS

Essential Question:

How do you multiply fractions?

EXAMPLE 1

Multiply

1) $\frac{1}{5} \cdot \frac{1}{3}$

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

2) $\frac{8}{9} \cdot \frac{3}{4}$

$\frac{8}{9} \cdot \frac{3}{4} = \frac{24}{36} = \frac{12}{18} = \frac{2}{3}$

$\frac{3}{8} \cdot \frac{12}{1} = \frac{36}{8} = \frac{9}{2}$

ON YOUR OWN

Multiply

1) $\frac{1}{2} \cdot \frac{5}{6} = \frac{5}{12}$

2) $\frac{7}{8} \cdot \frac{1}{4} = \frac{7}{32}$

3) $\frac{3}{7} \cdot \frac{2}{3}$

$\frac{3}{7} \cdot \frac{2}{3} = \frac{6}{21} = \frac{2}{7}$

4) $\frac{4}{9} \cdot \frac{3}{10}$

$\frac{4}{9} \cdot \frac{3}{10} = \frac{12}{90} = \frac{2}{15}$

MULTIPLYING FRACTIONS

1) Multiply the numerators and denominators (straight across)

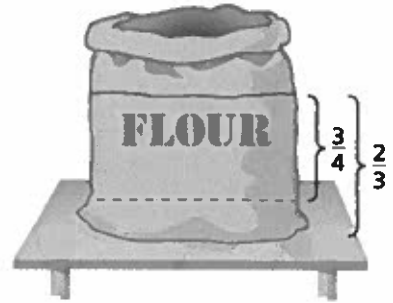
2) Simplify if necessary.

3) You can try to cross cancel before multiplying the two fractions. Try to divide out common factors first.

EXAMPLE 2

You have $\frac{2}{3}$ of a bag of flour. You use $\frac{3}{4}$ of the flour to make empanada dough. How much of the entire bag do you use to make the dough?

$\frac{2}{3} \cdot \frac{3}{4} = \frac{1}{2}$



You use $\frac{1}{2}$ of the entire bag.

Write $3\frac{2}{3}$ as an improper fraction.

$3\frac{2}{3} = \frac{11}{3}$

WRITING A MIXED NUMBER AS AN IMPROPER FRACTION (bounce the ball)

1) Multiply the whole number times the denominator.

2) Add that product with the numerator.

3) Write sum over original denominator

EXAMPLE 3

Multiply

1) $\frac{1}{2} \cdot 2\frac{3}{4}$

$$\frac{1}{2} \cdot \frac{11}{4} = \frac{11}{8}$$

$$2\frac{3}{8}$$

2) $1\frac{4}{5} \cdot 3\frac{2}{3}$

$$1\frac{9}{5} \cdot 3\frac{2}{3} = \frac{11}{5} \cdot \frac{11}{3} = \frac{33}{5} = 6\frac{3}{5}$$

ON YOUR OWN

Multiply

1) $\frac{1}{3} \cdot 1\frac{1}{6}$

$$\frac{1}{3} \cdot \frac{7}{6} = \frac{7}{18}$$

2) $3\frac{1}{2} \cdot \frac{4}{9}$

$$3\frac{1}{2} \cdot \frac{4}{9} = \frac{7}{2} \cdot \frac{4}{9} = \frac{28}{9}$$

3) $5\frac{5}{7} \cdot 2\frac{1}{10}$

$$5\frac{5}{7} \cdot 2\frac{1}{10} = \frac{40}{7} \cdot \frac{21}{10} = \frac{40 \cdot 21}{7 \cdot 10} = \frac{840}{70} = 12$$

4) $1\frac{7}{8} \cdot 2\frac{2}{5}$

$$1\frac{7}{8} \cdot 2\frac{2}{5} = \frac{15}{8} \cdot \frac{12}{5} = \frac{15 \cdot 12}{8 \cdot 5} = \frac{180}{40} = 4\frac{1}{2}$$

MULTIPLYING MIXED NUMBERS

- 1) Write each mixed number as an improper fraction.
- 2) Then multiply as you would with 2 fractions. Simplify if necessary.

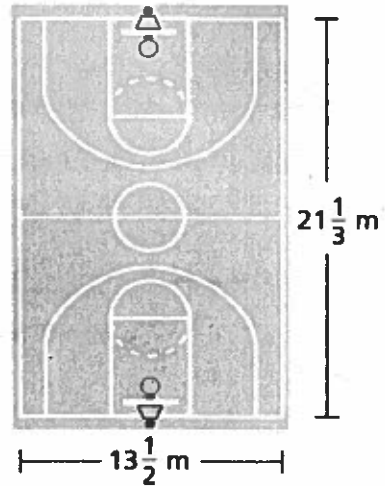
EXAMPLE 4

A city is resurfacing a basketball court. Find the area of the court?

Area = Length x width

A = $21\frac{1}{3} \times 13\frac{1}{2}$

$$\frac{64}{3} \cdot \frac{27}{2} = 288$$



The area of the court is 288 m^2 .

Multiply. Write in simplest form.

1) $\frac{3}{5} \cdot 6\frac{3}{4} \cdot 2\frac{2}{9}$

$$\frac{3}{5} \cdot \frac{27}{4} \cdot \frac{10}{9} = \frac{3 \cdot 27 \cdot 10}{5 \cdot 4 \cdot 9} = \frac{810}{180} = \frac{9}{2}$$

2) $(\frac{5}{7})^2 \cdot (\frac{3}{5})^2$

$$\frac{25}{49} \cdot \frac{9}{25} = \frac{9}{49}$$

3) $\frac{1}{4} \cdot \frac{5}{8} \cdot \frac{16}{25}$

$$\frac{1}{4} \cdot \frac{5}{8} \cdot \frac{16}{25} = \frac{1 \cdot 5 \cdot 16}{4 \cdot 8 \cdot 25} = \frac{80}{800} = \frac{1}{10}$$

4) $(2\frac{2}{5})^2$

$$2\frac{2}{5} \cdot 2\frac{2}{5} = \frac{12}{5} \cdot \frac{12}{5} = \frac{144}{25} \text{ or } 5\frac{19}{25}$$