

Unit 3: Operations with Fractions

1. Can you **add** fractions?

--Hint: Common denominator--

$$\frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$$

$$\frac{3 \times 4}{5 \times 4} + \frac{1 \times 5}{4 \times 5} = \frac{12}{20} + \frac{5}{20} = \frac{17}{20}$$

2. Can you **subtract** fractions?

$$\frac{6}{7} - \frac{2}{7} = \frac{4}{7}$$

$$\frac{7 \times 7}{8 \times 7} - \frac{3 \times 8}{7 \times 8} = \frac{49}{56} - \frac{24}{56} = \frac{25}{56}$$

3. Can you **convert mixed fraction and improper fractions?**

$$\frac{15}{4} = 3\frac{3}{4} \quad \frac{19}{8} = 2\frac{3}{8} \quad \frac{18}{6} = 3 \quad 2\frac{1}{3} = \frac{7}{3} \quad 4\frac{3}{8} = \frac{35}{8} \quad 5\frac{6}{7} = \frac{41}{7}$$

4. Can you **multiply** fractions?

$$\frac{3}{5} \times \frac{2}{5} = \frac{6}{25}$$

$$\frac{4}{6} \times \frac{9}{8} = \frac{36 \div 12}{48 \div 12} = \frac{3}{4}$$

$$2\frac{7}{9} \times 3\frac{1}{4} = \frac{25}{9} \times \frac{13}{4} = \frac{325}{36}$$

$$4 \times \frac{6}{7} = \frac{4}{1} \times \frac{6}{7} = \frac{24}{7}$$

5. Can you **divide** fractions? Multiply the **reciprocal**

$$\frac{7}{12} \div \frac{2}{5} = \frac{7}{12} \times \frac{5}{2} = \frac{35}{24}$$

$$\frac{5}{3} \div \frac{4}{5} = \frac{5}{3} \times \frac{5}{4} = \frac{25}{12}$$

$$1\frac{7}{8} \div 1\frac{1}{4} = \frac{15}{8} \div \frac{5}{4} = \frac{15}{8} \times \frac{4}{5} = \frac{60 \div 20}{40 \div 20} = \frac{3}{2}$$

$$7 \div \frac{2}{3} = \frac{7}{1} \times \frac{3}{2} = \frac{21}{2}$$

6. Can you simplify before solving? What operations can you apply this skill to?

$$\frac{32}{45} \times \frac{42}{56} = \frac{32}{45} \times \frac{21 \div 7}{28 \div 7} = \frac{32 \times 3}{45 \times 4} = \frac{24}{45}$$

$$\frac{72}{64} \div \frac{36}{76} = \frac{36 \div 4}{32 \div 4} \times \frac{18}{38} = \frac{9}{8} \div \frac{9}{19} = \frac{9}{8} \times \frac{19}{9} = \frac{19}{8}$$

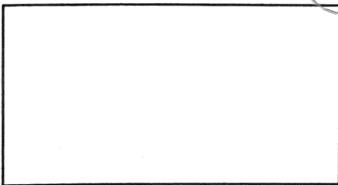
*This can be applied to multiplying + dividing fractions

7. Can you use diagrams to represent multiplication of fractions?

Shaded Rectangle

* for **proper fractions**

$$\frac{4}{7} \times \frac{2}{5} =$$

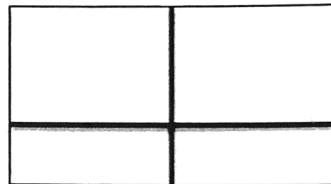


Omit #7

Rectangle Model/Partial Product

* for **mixed fractions** or double digit plus numbers

$$2\frac{1}{3} \times 5\frac{4}{7} =$$



8. Can you solve fraction word problems:

a) Ms. Lecky ordered pizza for a party. $\frac{5}{8}$ of the vegetarian pizza and $\frac{2}{3}$ of the ham and pineapple pizza were not eaten.

How much pizza was left?

$$1\frac{5}{8} + \frac{2}{3} = \frac{13 \times 3}{8 \times 3} + \frac{2 \times 8}{3 \times 8} = \frac{39}{24} + \frac{16}{24} = \frac{55}{24} \text{ OR } 2\frac{7}{24} \text{ pizzas were left!}$$

b) A dressmaker needs $3\frac{3}{8}$ m of fabric to sew one dress. How many dresses can be made with 28 m of fabric?

$$28 \div 3\frac{3}{8} = 28 \div \frac{27}{8} = \frac{28}{1} \times \frac{8}{27} = \frac{224}{27} = 8.296... \text{ so } 8 \text{ dresses!}$$

9. Solve:

a) $\frac{7}{9} - (\frac{1 \times 2}{3 \times 2} + \frac{5}{6}) \div 3$

$$\frac{7}{9} - (\frac{2}{6} + \frac{5}{6}) \div 3$$

$$\frac{7}{9} - \frac{7}{6} \times \frac{1}{3}$$

$$\frac{7 \times 2}{9 \times 2} - \frac{7}{18} = \frac{14}{18} - \frac{7}{18} = \frac{7}{18}$$

b) $4 \div \frac{2}{3} - 3\frac{1}{4} + \frac{7}{12}$

$$\frac{4}{1} \times \frac{3}{2} - \frac{13}{4} + \frac{7}{12}$$

$$\frac{12 \times 6}{2 \times 6} - \frac{13 \times 3}{4 \times 3} + \frac{7}{12}$$

$$\frac{72}{12} - \frac{39}{12} + \frac{7}{12}$$

$$= \frac{40 \div 4}{12 \div 4} = \frac{10}{3}$$

c) $\frac{5}{6} - \frac{2}{5} \times (\frac{1}{2} + \frac{1}{6})$

$$\frac{5}{6} - \frac{2}{5} \times (\frac{2}{6} + \frac{1}{6})$$

$$\frac{5}{6} - \frac{2}{5} \times \frac{4}{6}$$

$$\frac{5}{6} - \frac{2}{5} \times \frac{2}{3} = \frac{5 \times 5}{6 \times 5} - \frac{4 \times 2}{15 \times 2} = \frac{25}{30} - \frac{8}{30}$$

$$= \frac{17}{30}$$

d) $\frac{5}{6} - \frac{2}{5} \times \frac{1}{2} + \frac{1}{6}$

$$\frac{5}{6} - \frac{2}{10} + \frac{1}{6}$$

$$\frac{5 \times 5}{6 \times 5} - \frac{1 \times 6}{5 \times 6} + \frac{1 \times 5}{6 \times 5}$$

$$\frac{25}{30} - \frac{6}{30} + \frac{5}{30}$$

$$= \frac{24 \div 6}{30 \div 6} = \frac{4}{5}$$

e) $(\frac{5}{6} - \frac{2}{5}) \times (\frac{1}{2} + \frac{1}{6})$

$$= (\frac{25}{30} - \frac{12}{30}) \times (\frac{3}{6} + \frac{1}{6})$$

$$= \frac{13}{30} \times \frac{4}{6}$$

$$= \frac{13}{30} \times \frac{2}{3} = \frac{26}{90} = \frac{13}{45}$$