Topics

- Arithmetic rules involving the division of fractions

Write the divisions of $a \div b$ in fraction form as $\frac{a}{b}$. Then the rules are:

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$$

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

$$\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c} \qquad \frac{a-b}{c} = \frac{a}{c} - \frac{b}{c}$$

$$1 = \frac{a}{b} \times \frac{b}{a}$$

- Solving equations using rules with fractions

Example:

$$\frac{5}{7} x = 15$$

Multiply both sides by 7 $\qquad\qquad 5x = 15 \times 7$

Divide both sides by 5 $\qquad\qquad x = 15 \times \frac{7}{5}$

Or we could multiply directly both sides by $\frac{7}{5}$

$$\frac{5}{7} x = 15$$

$$x = 15 \times \frac{7}{5} = \frac{15 \times 7}{5} = 21$$

Problems

1. Write the following expressions as composite fractions:

$Example\colon a \div b \div c = a \div (b \div c) = a \div \frac{b}{c} = a \times \frac{c}{b} = \frac{a \times c}{b}$

a) $d \div c + b \div c =$

b) $(x - a \div 4) + x \div 4 =$

c) $a \times 4 - (5 + x) \div c =$

d) $(a + c - 1) \div (a - c) =$

2. Solve the following fractions

a) $\frac{2}{7} \cdot \frac{3}{4} =$

b) $5 \cdot \frac{4}{15} \cdot \frac{3}{8} =$

c) $\frac{15}{16} \cdot \left(\frac{4}{5} + \frac{8}{3}\right) =$

d) $\frac{3}{5} \cdot 1\frac{2}{3} + \frac{3}{5} \cdot 2\frac{1}{3} =$

3. Calculate the following expressions

a) $\frac{9}{8} \div \frac{3}{4} =$

b) $\left(\frac{3}{4} \div \frac{5}{6}\right) \div \frac{1}{2} =$

c) $1\frac{2}{3} \div \left(1\frac{1}{4} \div 2\right) =$

d) $2 \div \frac{1}{3} + \frac{1}{3} \div 2 + \frac{5}{6} =$

e) $12 \div \left(\frac{8}{15} \cdot \frac{3}{4}\right) =$

4. Solve the equations

a) $\frac{4}{9}x = 1\frac{1}{3}$

b) $\frac{2}{3}x + \frac{1}{6}x = \frac{3}{4}$

c) $\frac{2}{3}x - \frac{1}{6}x = 54$

5. Create equations to solve the following word problems

A. An apple costs 9c, and an orange 15c. Elena bought some apples and oranges, 20 fruits in all.

How many apples and how many oranges did she buy?

B. A tourist walked $\frac{2}{3}$ of her planned route. How many kilometers is her route if she has ten more kilometers to go?

C. A messenger was sent from one city to another that is many kilometers away. He can travel 40 km in one day. Another messenger was set a day after. He can travel 45 kilometers in one day. After how many days will the second messenger overtake the first one. Hint: create an equation where the unknown is the number of days.

6. (If time) Convert the fractions into fractions which denominator is 10 or 100.

   a) $\frac{14}{35} =$

   b) $\frac{2}{5} =$

   c) $75\% =$

   d) How much is 30% of 200?