



Math 8



Order of Operations with Fractions

- B - Brackets
- E - Exponents
- DM - Multiplication and Division in the order they occur
- AS - Addition and Subtraction in the order they occur common denominators

Get yesterday's sheets out

Examples:

$$(a) \frac{20}{21} \div \frac{3}{7} \times \frac{1}{5} + \left(\frac{1}{2} + \frac{1}{4}\right) \text{ c.D}$$

$$\frac{20}{21} \div \frac{3}{7} \times \frac{1}{5} + \left(\frac{2}{4} + \frac{1}{4}\right)$$

$$\frac{20}{21} \div \frac{3}{7} \times \frac{1}{5} + \frac{3}{4}$$

$$\frac{20}{21 \div 7} \times \frac{7 \div 7}{3} \times \frac{1}{5} + \frac{3}{4}$$

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

$$\frac{20 \div 5}{9} \times \frac{1}{5 \div 5} + \frac{3}{4}$$

$$\frac{4}{9} \times \frac{1}{1} + \frac{3}{4}$$

$$\frac{4 \cdot 4}{9 \cdot 4} + \frac{3 \cdot 9}{4 \cdot 9}$$

$$\frac{16}{36} + \frac{27}{36}$$

$$= \frac{43}{36}$$

$$= 1 \frac{7}{36} \div 9 \div 9$$

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

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$$4 \text{ a) } \frac{1}{3} \times \left(\frac{7}{8} - \frac{3}{4} \right)$$

$$\frac{1}{3} \times \left(\frac{7}{8} - \frac{6}{8} \right)$$

$$\frac{1}{3} \times \frac{1}{8} = \frac{1}{24}$$

$$b) \frac{7}{8} \div \left(\frac{1}{3} \times \frac{1}{8} \right)$$

$$\frac{7}{8} \div \frac{1}{24}$$

$$\frac{7}{8} \times \frac{24}{1} = 21$$



$$c) \frac{5}{9} \times \left(\frac{3}{5} \div \frac{1}{6} \right)$$

$$\frac{5}{9} \times \left(\frac{3}{5} \times \frac{6}{1} \right)$$

$$\frac{5}{9} \times \frac{18}{5} = \frac{270}{45}$$

$$= 6$$

$$d) \left(\frac{5}{3} + \frac{7}{12} \right) \times \frac{4}{9}$$

$$\left(\frac{20}{12} + \frac{7}{12} \right) \times \frac{4}{9}$$

$$\frac{27}{12} \times \frac{4}{9} = \frac{108}{108} = 1$$

(or $\frac{108}{108} = 1$)

$$5. \frac{10}{8} + \frac{9}{12} + \frac{3}{2} \times \frac{1}{2}$$

$$\frac{10}{8} + \frac{9}{12} + \frac{3}{4}$$

$$= \frac{10}{8} + \frac{9}{12} + \frac{6}{8}$$

$$= \frac{10}{8} + \frac{9}{12} + \frac{6}{8}$$

Raj was correct.

$$\begin{aligned}
 a) \quad & \frac{1}{2} \times \frac{3}{5} + \frac{1}{4} \\
 & \frac{3}{10} + \frac{1}{4} \\
 & \frac{6}{20} + \frac{5}{20} = \frac{11}{20}
 \end{aligned}$$

$$\begin{aligned}
 b) \quad & \frac{2}{3} + \frac{5}{6} \div \frac{1}{2} \\
 & \frac{2}{3} + \frac{5}{6} \times \frac{2}{1} \\
 & \frac{4}{3} + \frac{10}{6} \\
 & \frac{4}{3} + \frac{10}{6} = \frac{14}{6} \text{ or } \frac{7}{3}
 \end{aligned}$$

$$\begin{aligned}
 c) \quad & \frac{4}{5} \div \frac{7}{10} + \frac{1}{3} \\
 & \frac{4}{5} \times \frac{10}{7} + \frac{1}{3} \\
 & \frac{40}{35} + \frac{1}{3} \\
 & \frac{24}{21} + \frac{7}{21} = \frac{31}{21} = \frac{10}{7}
 \end{aligned}$$

$$\begin{aligned}
 d) \quad & \frac{1}{4} \times \left(\frac{11}{12} - \frac{5}{6} \right) \\
 & \frac{1}{4} \times \left(\frac{11}{12} - \frac{10}{12} \right) \\
 & \frac{1}{4} \times \frac{1}{12} = \frac{1}{48}
 \end{aligned}$$

$$\begin{aligned}
 e) \quad & \frac{1}{2} \times \left(\frac{4}{5} \div \frac{3}{10} \right) \\
 & \frac{1}{2} \times \left(\frac{4}{5} \times \frac{10}{3} \right) \\
 & \frac{1}{2} \times \frac{40}{3} = \frac{40}{6} \\
 & = \frac{20}{3}
 \end{aligned}$$

$$\begin{aligned}
 f) \quad & \left(\frac{3}{5} + \frac{7}{15} \right) \times \frac{5}{6} \\
 & \left(\frac{9}{15} + \frac{7}{15} \right) \times \frac{5}{6} \\
 & \frac{16}{15} \times \frac{5}{6} = \frac{80}{90} \\
 & = \frac{8}{9}
 \end{aligned}$$

A recipe calls for $3\frac{3}{4}$ cups of flour and $2\frac{1}{2}$ cups of sugar. If one batch makes 14 cookies then answer the following.

a) How much more flour than sugar does the recipe have?

$$3\frac{3}{4} - 2\frac{1}{2}$$

$$\frac{15}{4} - \frac{5}{2} \cdot \frac{2}{2} \text{ c.o}$$

$$\frac{15}{4} - \frac{10}{4} = \frac{5}{4} = 1\frac{1}{4}$$

We have $1\frac{1}{4}$ cup more flour than sugar.

b) How much flour and sugar does the recipe have altogether?

$$3\frac{3}{4} + 2\frac{1}{2}$$

$$\frac{15}{4} + \frac{10}{4}$$

$$\frac{25}{4} = 6\frac{1}{4}$$

All together we have $6\frac{1}{4}$ cups of flour and sugar.

c) If I want to make $4\frac{1}{2}$ batches then how much sugar is needed?

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

$$\frac{5}{2} \times \frac{9}{2} = \frac{45}{4} = 11\frac{1}{4}$$

We need $11\frac{1}{4}$ cups of sugar for $4\frac{1}{2}$ batches.

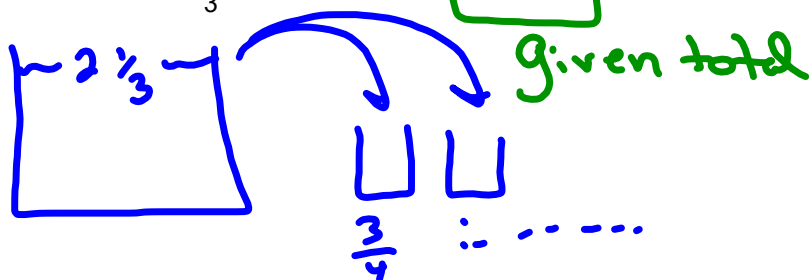
d) If I make $4\frac{1}{2}$ batches then how many cookies can I make?

$$4\frac{1}{2} \times 14$$

$$\frac{9}{2} \times \frac{14}{1} = \frac{126}{2} = \frac{63}{1} \Rightarrow 63$$

So $4\frac{1}{2}$ batches will make 63 cookies.

A jug holds $2\frac{1}{3}$ cups of juice in total. How many $\frac{3}{4}$ can you fill?



\div

$$2\frac{1}{3} \div \frac{3}{4}$$

$$\frac{7}{3} \div \frac{3}{4}$$

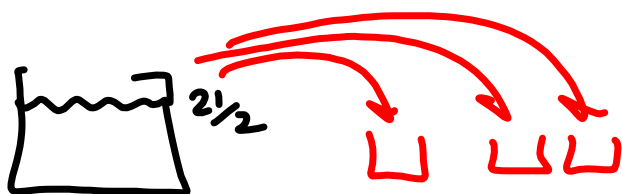
$$\frac{7}{3} \times \frac{4}{3}$$

$$= \frac{28}{9}$$

$$= 3\frac{1}{9}$$

We can fill $3\frac{1}{9}$ cups that are $\frac{3}{4}$ full.

A jug holds $2\frac{1}{3}$ cups of juice in total. How many $\frac{3}{4}$ can you fill?



$$2\frac{1}{3} \div \frac{3}{4}$$

$$\frac{7}{3} \div \frac{3}{4}$$

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

Class/Homework

Test Tuesday, Dec. 19

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has answers

pg. 155 # 6-11 for today
pg. 159 # 1-4

Test Outline

7 Multiple Choice 7 points
7 Short Response 47 points
Review for Test

change
54

Be able to find equivalent fractions and reduce fractions

Be able to change from mixed number to an improper fraction and vice versa

Be able to add and subtract proper, improper fractions and mixed numbers

Be able to model multiplication of fractions using number lines and squares.

~~Be able to model division of fractions using number lines and squares.~~

Be able to multiply and divide fractions and mixed numbers using "rules"

Be able to solve word problems involving addition, subtraction, multiplication and division of fractions.

Be able to solve order of operations questions involving fractions.