First Set of Homework for Math 05

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Please note: You should fully justify your answers.

Review of fractions

1. Replace the question marks with natural numbers so that the resulting equations are true:
   (a) $\frac{1}{2} = \frac{?}{4} = \frac{3}{?} = \frac{?}{20} = \frac{15}{?}$
   (b) $\frac{3}{5} = \frac{?}{20} = \frac{6}{?} = \frac{?}{100} = \frac{21}{?}$
   (c) $\frac{0}{3} = \frac{?}{4} = \frac{?}{7}$
2. Write each fraction in the simplest form:
   (a) $\frac{9}{15}$
   (b) $\frac{10}{24}$
   (c) $\frac{18}{60}$
   (d) $\frac{11}{66}$
   (e) $\frac{21}{30}$
3. Can you find a natural number to replace the question mark so that the following equation is true? How about if you are allowed to use rational numbers?
$$\frac{2}{5} = \frac{?}{3}$$
4. Perform the following multiplications and divisions. Give your answers in the simplest possible form:
   (a) $\frac{2}{3} \cdot \frac{5}{7}$
   (b) $\frac{7}{10} \cdot \frac{5}{21}$
   (c) $\frac{70}{12} \cdot \frac{28}{77}$
   (d) $\frac{2}{5} \div \frac{5}{6}$
   (e) $\frac{3}{11} \div \frac{12}{33}$
   (f) $\frac{\frac{2}{5}}{\frac{3}{7}}$
5. Perform the following additions and subtractions. Give your answers in the simplest possible form:
   (a) $\frac{4}{7} + \frac{3}{7}$

(b) $\frac{2}{3}+\frac{3}{4}$

(c) $\frac{1}{2}+\frac{3}{5}$

(d) $3+\frac{3}{5}$

(e) $\frac{1}{4}+\frac{7}{12}$

(f) $\frac{2}{15}+\frac{3}{10}+\frac{4}{5}$

(g) $\frac{5}{6}+\frac{3}{4}+\frac{11}{12}$

(h) $\frac{5}{8}-\frac{3}{8}$

(i) $\frac{1}{2}-\frac{1}{3}$

(j) $\frac{17}{24}-\frac{5}{16}$

(k) $7-\frac{10}{3}$

6. Put the appropriate symbol ($<$, $>$, or $=$) in the blank so that we get a true statement:

(a) $\frac{3}{5}$ $\quad$ $\frac{4}{5}$

(b) $\frac{5}{7}$ $\quad$ $\frac{5}{8}$

(c) $\frac{2}{5}$ $\quad$ $\frac{3}{4}$

(d) $\frac{3}{5}$ $\quad$ $\frac{9}{15}$

(e) $\frac{7}{9}$ $\quad$ $\frac{2}{3}$

7. Put the following fractions in the numberline:

$$\frac{2}{7},\quad \frac{1}{2},\quad -\frac{13}{5},\quad -\frac{3}{2},\quad -\frac{11}{4},\quad \frac{30}{7}$$