

First Set of Homework for Math 05

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Please note: You should fully justify your answers.

1 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. Find the perimeter and the area of the rectangle in Figure 1

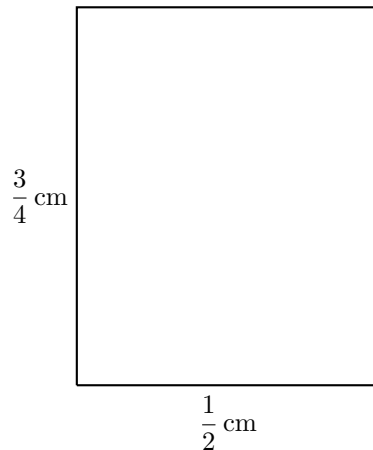


Figure 1: The rectangle of Question 6

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

- (a) $\frac{3}{5}$ $\frac{4}{5}$
- (b) $\frac{5}{7}$ $\frac{5}{8}$
- (c) $\frac{2}{5}$ $\frac{3}{4}$
- (d) $\frac{3}{5}$ $\frac{9}{15}$
- (e) $\frac{7}{9}$ $\frac{2}{3}$

2 Signed numbers

1. Simplify the following expressions:

- (a) $-(-3)$
- (b) $-(-(-5))$
- (c) $|-5|$
- (d) $-|-3|$
- (e) $|-(-(-7))|$

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

- (a) -7 3
- (b) -8 -9
- (c) $|-8|$ $|-9|$
- (d) 3 $-(-3)$
- (e) $|-4|$ -5
- (f) 3 $|-3|$

3. Perform the indicated operations:

- (a) $12 + (-5)$
- (b) $-13 + 7$
- (c) $-3 + (-4)$
- (d) $-\frac{2}{3} + \frac{1}{2}$
- (e) $\frac{7}{9} - 2$
- (f) $\frac{3}{5} - \frac{5}{6}$
- (g) $5 - 8$
- (h) $-3 - 4$
- (i) $2 - (-21)$
- (j) $-7 - (-12)$
- (k) $-\frac{3}{5} - \frac{2}{5}$
- (l) $\frac{2}{7} - \left(-\frac{12}{7}\right)$
- (m) $-\frac{1}{3} - \frac{1}{6}$
- (n) $3 - 6 - (-9)$
- (o) $-7 - (-8) - 2$

4. The temperature dropped from 12°F to -3°F . What was the drop in temperature?

5. An elevator started at the 32nd floor. It then went down 11 floors, then up 7 floors and then down 6 floors. At what floor is the elevator?