

Review of Homework 5

In some remote village, many years ago villagers bred dragons. Somehow on a weekend day or a holiday the villagers had 2 eggs less hatching than on a week day. How many dragons have been hatching on a week day and on a weekend day if within one full week 80 more dragons were added to the dragon flock?

Compute by the most convenient way:

$$12 \cdot 87 + 35 \cdot 13 + 87 \cdot 23 =$$

$$41 \cdot 80 - 25 \cdot 41 + 55 \cdot 29 =$$

Mary has a rectangular backyard with sides of 48 and 40 yards. She wants to create square flower beds and plant different kind of flowers in each flower bed. **What is the largest possible size of one square flower bed if she makes all squares equal?** What if the dimensions of the original backyard were 18 and 25 yards?

Fractions



What part of the first bar is blue? $\frac{1}{3}$ What part of the second bar is blue? $\frac{4}{12}$

$\frac{1}{3} = \frac{4}{12}$ **Equivalent fractions.** Did you notice something?

Well, if you multiply both the numerator and denominator of $\frac{1}{3}$ by 4

$$\frac{1}{3} \times 4 = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$$

If we multiply both the numerator and denominator of a fraction by the same non-zero number (it would be the same as multiplying the fraction by 1), the fraction will not change.

$$\frac{4}{12} \div 4 = \frac{4 \div 4}{12 \div 4} = \frac{1}{3}$$

If we divide numerator and denominator of a fraction by the same number (if they have a **common factor**), the fraction will not change. This process is called **simplification of fractions**.

Simplify:

$$\frac{27}{108} = \frac{27 \div 3}{108 \div 3} = \frac{9 \div 3}{36 \div 3} = \frac{3 \div 3}{12 \div 3} = \frac{1}{4}$$

Could this be done faster, let's say in one step?

Remember what GCF is? Greatest Common Factor! Find the GCF for 27 and 108!

Now, we divide numerator and denominator of $\frac{27}{108}$ by.....

Simplify:

a) $\frac{4}{20}$

b) $\frac{6}{8}$

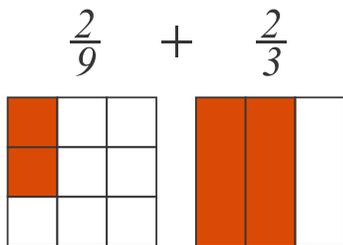
c) $\frac{12}{18}$

f) $\frac{12 \times 5 + 12 \times 9}{12 \times 21} =$

g) $\frac{14 \times 5 + 14 \times 2}{28} =$

Addition and subtraction of fractions with unlike denominators.

Can we easily compute $\frac{2}{9} + \frac{3}{9}$? Let's now try to add $\frac{2}{9}$ and $\frac{2}{3}$.



Are two fractions $\frac{2}{9}$ and $\frac{2}{3}$ similar objects?

$$\frac{2}{9} = \frac{1}{9} + \frac{1}{9}$$

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

How we can calculate?

$$\frac{2}{9} + \frac{2}{3} = \frac{1}{9} + \frac{1}{9} + \frac{1}{3} + \frac{1}{3}$$

- To be able to add two fractions we must rewrite them as fractions with **the same denominator**.
- The best choice for such common denominator is the **least common multiple (LCM)** of the denominators of original fractions.
- When you find the **factor** by which you need to multiply your denominator, remember to **multiply the numerator by the same number** so that your fraction remains the same
- For example,

$$\frac{3}{9} + \frac{2}{3} = \frac{3}{9} + \frac{2 \times 3}{3 \times 3} = \frac{3}{9} + \frac{6}{9} =$$

Exercises.

1. Compute:

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

$$\frac{7}{15} - \frac{1}{5} =$$

$$\frac{5}{12} + \frac{4}{15} =$$

2. Compare (>, <, or =):

a) $\frac{4}{5} \square \frac{3}{7}$

b) $\frac{11}{16} \square \frac{5}{12}$

c) $\frac{7}{12} \square \frac{5}{9}$

3. Calculate:

a) $\frac{1}{8} + \frac{3}{4}$

b) $\frac{2}{5} + \frac{3}{8}$

c) $\frac{5}{12} - \frac{1}{4}$

d) $\frac{3}{5} - \frac{3}{8}$

4. Simplify expressions:

a. $x - 5 + 2x - 7 - 6x + 24 - 15$

b. $3y - 5x - 8 + 23 - 45x + 6y + 7x - 23y - 99$

5. In a zoo there are birds (they have 2 legs each) and mammals with 4 legs each. How many birds and mammals are in the zoo, if they have 6000 legs and 2500 heads altogether? (use substitution)

6. How will the product change if?

a. one factor increases two times

b. one factor is three times smaller

c. one factor increases 2 times and second factor decreases 8 times

d. one factor increases 2 times and another factor increases 3 times

e. one factor decreases 2 times and another factor decreases 3 times