

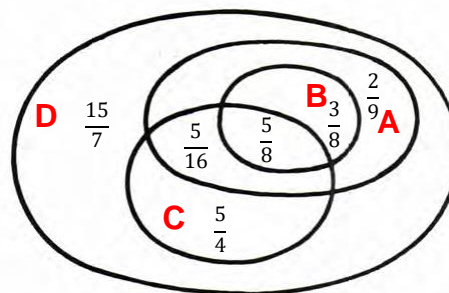
Accelerated math. Homework 6.



Problems marked with * are more difficult.

- On the picture below 4 Venn diagrams are drawn. They represent sets A, B, C, and D.

A is a set of proper fractions,
 B is a set of proper fractions with denominator 8,
 C is a set of fractions with nominator 5,
 D is a set of all fractions.



Mark the sets A, B, C, and D. Put the following fractions into the right set:

$$\frac{2}{9}, \frac{15}{7}, \frac{3}{8}, \frac{5}{8}, \frac{5}{16}, \frac{5}{4}$$

- 10 points marked on the straight line so that distance between any 2 neighboring points is 5 cm, what is the distance between the first and the last points.

$$9 \cdot 5 \text{ cm} = 45 \text{ cm}$$

- Peter, Mark, and John got 75 candies altogether on Trick-o-treat. After Peter ate 8 candies, Mark ate 12, and John ate 7, the amount of candies that each boy has became equal. How many candies did each of them get? Write an equation to solve the problem.

given	solution
Peter → P candies Mark → M candies John → J candies $P - 8 = M - 12 = J - 7$ $P + M + J = 75$	Let's x to be the number of candies that each of them has at the end, it means that before eating candies $P = x + 8, \quad M = x + 12, \quad J = x + 7$ $x + 8 + x + 12 + x + 7 = 75$ $3x + 27 = 75$ $3x = 75 - 27 = 48$ $x = 48 \div 3 = 16$ $P = 16 + 8 = 24, \quad M = 16 + 12 = 28, \quad J = 16 + 7 = 23$ Answer: Peter had 24 candies, Mark had 28, and John had 23.

4. Which number should be placed instead of x to get an equality.

a) $25 \cdot x = -25$;

b) $x : 1 = -7$;

c) $x \cdot (-18) = 0$;

d) $-26 : x = 26$;

e) $x \cdot (-30) = 30$;

f) $x : (-8) = 0$;

g) $-19 \cdot x = 19$;

h) $x : (-1) = -1$?

<p>a. $25 \cdot x = -25$ $x = (-25) : 25 = -1$</p> <p>b. $x : 1 = -7$ $x = (-7) \cdot 1 = -7$</p> <p>c. $x \cdot (-18) = 0$ $x = 0$</p> <p>d. $-26 : x = 26$ $x = (-26) : 26 = -1$</p>	<p>e. $x \cdot (-30) = 30$ $x = 30 : (-30) = -1$</p> <p>f. $x : (-8) = 0$ $x = 0$</p> <p>g. $-19 \cdot x = 19$ $x = (-19) : 19 = -1$</p> <p>h. $x : (-1) = -1$ $x = (-1) \cdot (-1) = 1$</p>
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5. Compute:

a) $3 - \left(\frac{3}{7} - \frac{12}{35}\right) : \frac{6}{7}$;

b) $\frac{1}{2} - \frac{3}{4} \cdot \left(\frac{7}{15} - \frac{3}{10}\right)$;

c) $\frac{3}{4} : \frac{9}{16} - \frac{5}{8} \cdot \frac{4}{15}$;

d) $\frac{20}{27} \cdot \frac{3}{5} + \frac{1}{10} : \frac{3}{100}$;

a. $3 - \left(\frac{3}{7} - \frac{12}{35}\right) : \frac{6}{7} = 3 - \left(\frac{3}{7} - \frac{12}{35}\right) \cdot \frac{7}{6} = 3 - \left(\frac{3}{7} \cdot \frac{7}{6} - \frac{12}{35} \cdot \frac{7}{6}\right) = 3 - \left(\frac{1}{2} - \frac{2}{5}\right) = 3 - \left(\frac{5}{10} - \frac{4}{10}\right) =$
 $= 3 - \frac{1}{10} = 2\frac{9}{10}$

b. $\frac{1}{2} - \frac{3}{4} \cdot \left(\frac{7}{15} - \frac{3}{10}\right) = \frac{1}{2} - \frac{3}{4} \cdot \left(\frac{14}{30} - \frac{9}{30}\right) = \frac{1}{2} - \frac{3}{4} \cdot \frac{5}{30} = \frac{1}{2} - \frac{1}{4 \cdot 2} = \frac{1}{2} - \frac{1}{8} = \frac{4}{8} - \frac{1}{8} = \frac{3}{8}$

c. $\frac{3}{4} : \frac{9}{16} - \frac{5}{8} \cdot \frac{4}{15} = \frac{3}{4} \cdot \frac{16}{9} - \frac{5}{8} \cdot \frac{4}{15} = \frac{4}{3} - \frac{1}{2 \cdot 3} = \frac{8-1}{6} = \frac{7}{6}$

d. $\frac{20}{27} \cdot \frac{3}{5} + \frac{1}{10} : \frac{3}{100} = \frac{4}{9} + \frac{1}{10} \cdot \frac{100}{3} = \frac{4}{9} + \frac{10}{3} = \frac{4}{9} + \frac{30}{9} = \frac{34}{9}$

6. Positive or negative number will be the product of

- a) Two negative and one positive numbers. – Positive $((-)\cdot(-)\cdot(+)=+)\cdot(+)=+)$
- b) One negative and two positive numbers – Negative $((-)\cdot(+)\cdot(+)=(-)\cdot(+)=(-))$
- c) Three negative numbers. – Negative $((-)\cdot(-)\cdot(-)=(+)\cdot(-)=(-))$

7. Rewrite without parenthesis:

$$20 + (2 - 3) = 20 + 2 - 3$$

$$20 - (-2 + 3) = 20 + 2 - 3$$

$$20 - (2 - 3) = 20 - 2 + 3$$

$$20 - (-2 + (-3)) = 20 + 2 + 3$$

8. A swimming pool can be filled by one pipe in 10 hours or by another pipe in 15 hours. How long it will take to fill the pool with both pipes opened?

In one hour first pipe will fill $\frac{1}{10}$ th of the pool, second pipe in 1 hour will fill $\frac{1}{15}$ th of the pool, if both pipes are opened $\frac{1}{10} + \frac{1}{15}$ part of the pool will be filled in 1 hour.

$$\frac{1}{10} + \frac{1}{15} = \frac{3}{30} + \frac{2}{30} = \frac{5}{30} = \frac{1}{6}$$

Answer: with both pipe opened the pool will be filled in 6 hours.

9. Compute:

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

$$-\frac{3}{8} + \left(-\frac{1}{2}\right) = -\frac{3}{8} + \left(-\frac{4}{8}\right) = -\frac{7}{8}$$

$$-\frac{3}{8} + \left(-\frac{1}{2}\right) = -\frac{3}{8} + \left(-\frac{4}{8}\right) = -\frac{7}{8}$$

$$-\frac{1}{6} + \frac{2}{3} = -\frac{1}{6} + \frac{4}{6} = \frac{3}{6} = \frac{1}{2}$$

$$-\frac{4}{5} + \left(-\frac{1}{10}\right) = -\frac{8}{10} + \left(-\frac{1}{10}\right) = -\frac{9}{10}$$

$$\frac{5}{9} + \left(-\frac{1}{3}\right) = \frac{5}{9} + \left(-\frac{3}{9}\right) = \frac{2}{9}$$

$$-\frac{3}{8} + \frac{1}{4} = -\frac{3}{8} + \frac{2}{8} = -\frac{1}{8}$$

$$-\frac{8}{7} + \left(-\frac{3}{14}\right) = -\frac{16}{14} + \left(-\frac{3}{14}\right) = -\frac{19}{14}$$

$$\frac{7}{12} + \left(-\frac{3}{4}\right) = \frac{7}{12} + \left(-\frac{9}{12}\right) = -\frac{2}{12} = -\frac{1}{6}$$

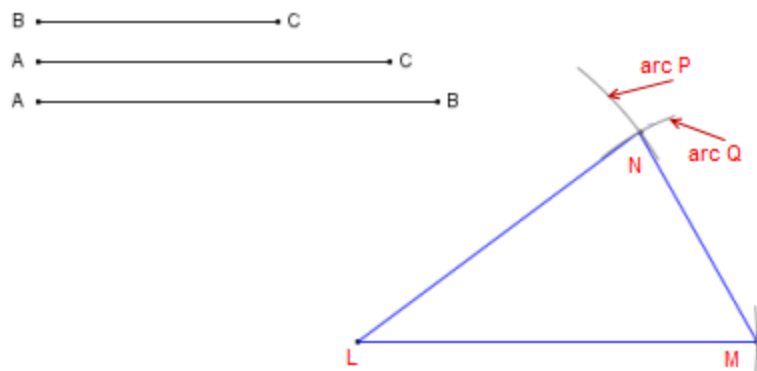
10. Simplify the following fractions:

$$\frac{14 \cdot 5 - 14 \cdot 2}{28} = \frac{14(5 - 2)}{14 \cdot 2} = \frac{3}{2}$$

$$\frac{8 \cdot 8 - 8 \cdot 7}{8 \cdot 5} = \frac{8(8 - 7)}{8 \cdot 5} = \frac{1}{5}$$

$$\frac{19 \cdot 8 - 19 \cdot 6}{38} = \frac{19 \cdot (8 - 6)}{19 \cdot 2} = \frac{2}{2} = 1$$

11. Construct the triangle with the sides as on picture below (use a compass and a ruler)



You can find very good explanation here.

<https://www.mathopenref.com/consttriangles.html>