Math 4. Class Work 18

Distance, speed, and time

Let's denote the rate (speed) of the car *v*, the time during which the car was moving *t*, and the distance it traveled, *S*.

$$S = v \cdot t = vt$$

If $v = 70\ km/h$ and $t = 3\ h$, then $S = 70\frac{km}{h} \cdot 3h = 70km$.

If we know two out of three parameters, we can always find the third one.

$$S = vt; \quad v = \frac{S}{t}; \quad t = \frac{S}{v};$$

Relation between units

$$1\ kilometer\ (km) = 1000\ meters(m)$$
$$1\ meter = 100\ centimeters\ (cm)$$
$$1\ hour\ (h) = 60\ minutes(min)$$
$$1\ minute\ (min) = 60\ seconds(s)$$

Geometry notations

k = Circ(M, r =4 cm) - a circle with a center at point M and a radius of 4 cm.

{P, Q, R} - a list of points , |AB| = 3 cm – the size of a segment $\overline{AB}$

∩ - intersection symbol, || - parallel lines, ∈ - belongs to, an element of a list or object

Problems

1. Calculate

a) $\frac{3}{20} \times \frac{5}{9} =$ $\frac{6}{7} \times \frac{1}{3} =$ $\frac{1}{4}x \cdot \frac{2}{3} =$ $3 \cdot \frac{2}{5}x =$

b) $\frac{1}{2} : \frac{3}{4} =$ $6 : \frac{2}{3} =$ $7 : \frac{2}{7} =$ $12 : \frac{3}{4} =$

$$x : \frac{a}{b} = x \times \frac{b}{a}$$

$$: \frac{a}{b} \asymp \times \frac{b}{a}$$

2. Convert the following values

   a) Distance: 23 km into meters

      2500 cm into km

   b) Time: 3 h into minutes

      10800 s into h

   c) Speed: 12 m/s into km/h

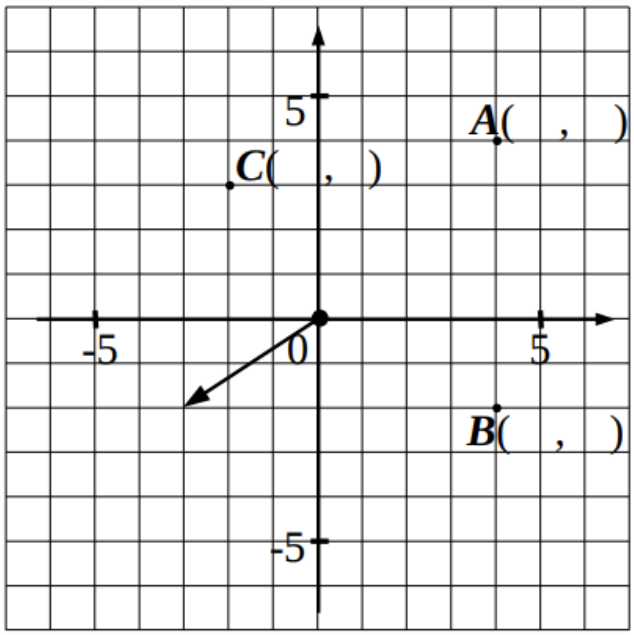
      3 km/h into m/s

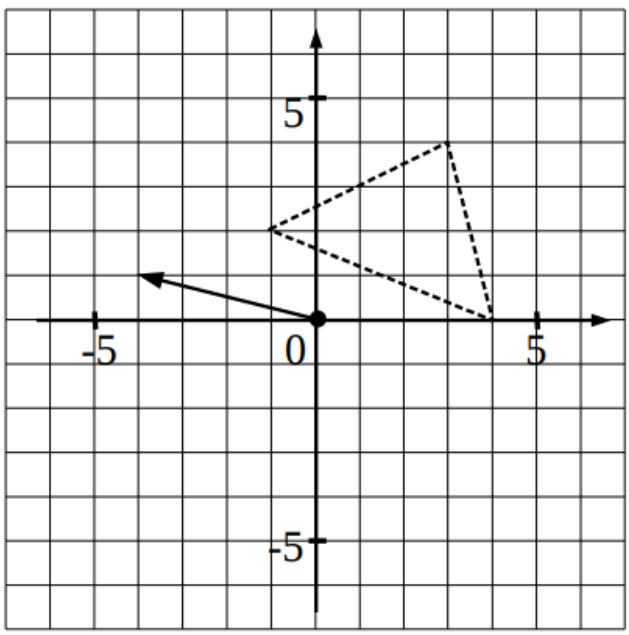
3. Alice and Bob decide to walk from their campsite to a scenic overlook. They take different routes, but the distance is the same for both of them. Alice walks at a steady pace of 3 miles per hour, while Bob walks at 4 miles per hour. Bob arrives at the overlook 1 hour earlier than Alice. How far is it from the campsite to the scenic overlook?

4. Sarah and Michael both start walking at the same time. Sarah walks at a pace of 3 miles per hour, while Michael walks at a pace of 4 miles per hour. After 2 hours of walking, they stop.
   How much further did Michael walk than Sarah?

5. Using only a ruler and a compass plot
   a) Plot a straight line $KT \perp m$
   b) Divide a segment AB into two equal parts

6. Translate points and shapes according to the instructions given by the arrows:





7. Solve the equations

a) $\frac{x+1}{2x-1} = 2$

b). $2x + |x - 1| = 2$