

## MATH 4: Homework 17

Due February 10, before the start of the class

Homework must be submitted on time—at least 15 minutes before the start of the class.

Homework will not be graded after the solutions are posted on Google Classroom.

Write the answers on separate sheets of paper, not between the lines.

1. Represent in units in **km/h** (kilometers per hour) and find out whose speeds they are. Use the following relations between units and see the Class notes for added examples in problem 4.

$$1 \text{ kilometer (km)} = 1000 \text{ meters (m)} \quad \text{then } 1 \text{ m} = \frac{1 \text{ km}}{1000}$$

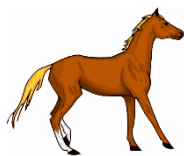
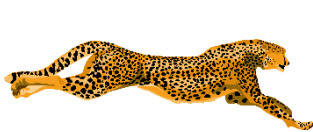
$$1 \text{ meter} = 100 \text{ centimeters (cm)} \quad \text{then } 1 \text{ cm} = \frac{1 \text{ m}}{100}$$

$$1 \text{ hour (h)} = 60 \text{ minutes (min)} \quad \text{then } 1 \text{ min} = \frac{1 \text{ hour}}{60}$$

$$1 \text{ minute (min)} = 60 \text{ seconds (s)} \quad \text{then } 1 \text{ second} = \frac{1 \text{ min}}{60}$$

$$1 \text{ hour (h)} = 3600 \text{ seconds (s)} \quad \text{then } 1 \text{ second} = \frac{1 \text{ h}}{3600}$$

a.  $83 \frac{\text{cm.}}{\text{min.}}$ ; b.  $83 \frac{\text{m.}}{\text{min.}}$ ; c.  $31 \frac{\text{m.}}{\text{s.}}$  d.  $83 \frac{\text{cm.}}{\text{s.}}$ ; e.  $800 \frac{\text{m.}}{\text{min.}}$



Example: a)  $83 \frac{\text{cm.}}{\text{min.}} = 83 \times \frac{1 \text{ cm}}{1 \text{ min}} = 83 \times \frac{\frac{1 \text{ m}}{100}}{\frac{1 \text{ h}}{60}} = 83 \times \frac{1 \text{ m}}{100} \times \frac{60}{1 \text{ h}} = 49.8 \frac{\text{m}}{\text{h}} =$

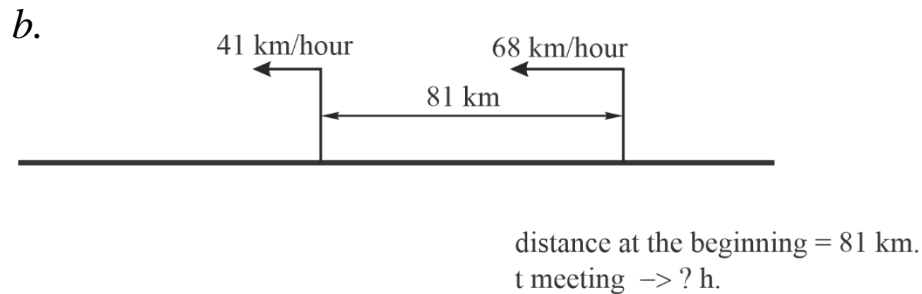
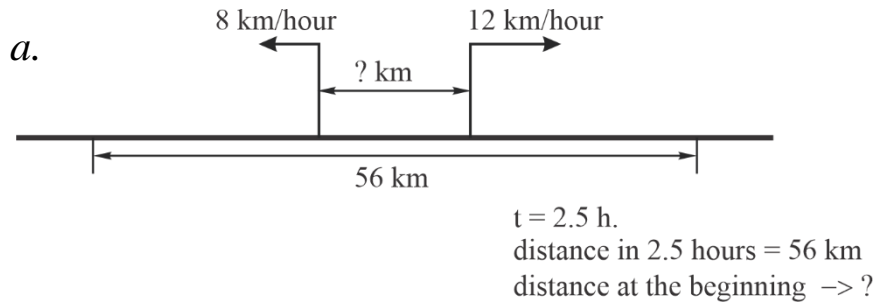
$$49.8 \frac{\frac{1 \text{ km}}{1000}}{\text{h}} = 0.0498 \frac{\text{km}}{\text{h}}$$

↑ division of fractions is multiplication

b)  $83 \frac{\text{m.}}{\text{min.}} = 83 \times \frac{1 \text{ m}}{1 \text{ min}} = 83 \times \frac{\frac{1 \text{ km}}{1000}}{1 \text{ min}} = \text{continues ....}$

2. A pedestrian covers a distance in 3 hours 45 minutes. The same distance can be covered by a cyclist in 45 minutes. How many times faster is the cyclist compared to the pedestrian? Hint: convert the 3 hours and 45 minutes in minutes.

3. For the two pictures below, come up with the problem and solve it.



4. Find number A and number B. Then calculate what fraction of number B is number A?

Hint:  $x \cdot B = A$

$$A = \left(4\frac{7}{9} - 2\frac{5}{6}\right) : 1\frac{5}{9} + \frac{4}{9} \cdot 6\frac{3}{16} \quad B = \left(1\frac{2}{3} + 2\frac{3}{4}\right) : 8\frac{5}{6} \cdot \left(1\frac{5}{12} - \frac{4}{9}\right) : 2\frac{1}{3} \cdot 24$$

5. Open the parentheses. Are the left and the right sides equal?

a)  $(2x + 6) \cdot \frac{3}{4} - (3 + x) \cdot \frac{1}{2} = x + 3$

b)  $(4x + y - 1) \cdot \frac{3}{5} - (2x + 3y + 2) : 5 = 2x - 1$

c)  $(2x + 4y - 6) : 4 - \frac{1}{2} \cdot (x + 2y) - \left(\frac{1}{2} - x\right) = x - 2$

6. Solve the equations below.

a)  $2 \cdot (3x - 4) + 3 \cdot (2 - x) = 2(x + 1) + 5$

**Optional \*b)**  $2x + |x| = x + 1$

Strat by moving  $2x$  on the right, then use

$|a| = a$  if  $a \geq 0$ ; or  $|a| = a \cdot (-1)$  if  $a < 0$