

Honors Math 3

Unit 5 - Day 6 Homework

Please do your work on a separate sheet of paper. You must show ALL work and attempt ALL problems to receive full credit. Please check your answers BEFORE class!

1. A town's old street sweeper can clean the streets in 60 h. The old sweeper together with a new sweeper can clean the streets in 15 h. How long would it take the new sweeper to do the job alone?

$$\frac{1}{60} \cdot 15 + \frac{1}{x} \cdot 15 = 1 \quad / \quad \frac{1 \cdot x + 15 \cdot 4}{4x \cdot x \cdot 4} = \frac{1 \cdot 4x}{4x} \rightarrow 3x = 60$$

$$x + 60 = 4x \quad \rightarrow \quad x = 20 \text{ hours}$$

2. John can shovel the snow from the sidewalk in 12 minutes, and James can do it in 18 minutes. How long will it take them to shovel the snow from the sidewalk if they work together?

7 1/5 minutes

$$\frac{t}{12} + \frac{t}{18} = \frac{1}{36} \rightarrow 3t + 2t = 36$$

$$5t = 36$$

$$t = 7.2 \text{ minutes}$$

3. Jackie can sew a dress in 8 hours, but she and her friend working together can sew the dress in 6 hours. How long would it take the friend working alone?

24 hours

$$\frac{1}{8} \cdot 6 + \frac{1}{x} \cdot 6 = 1 \quad 3x + 24 = 4x$$

$$\frac{3 \cdot x + 6 \cdot 4}{4 \cdot x \cdot x \cdot 4} = \frac{1 \cdot 4x}{4x}$$

$$x = 24 \text{ hrs.}$$

4. It takes Mr. Smith 10 hours to paint a room. If he works for 1 hour and then asks Mrs. Smith to help him, they finish in 2 more hours. In what time can Mrs. Smith do the whole job?

2 6/7 hours

$$\frac{1}{10} (2) + \frac{1}{x} (2) = \frac{9}{10} \quad \leftarrow \text{already completed } \frac{1}{10}$$

$$\frac{2 \cdot x + 2 \cdot 10}{10 \cdot x + x \cdot 10} = \frac{9 \cdot x}{10 \cdot x} \rightarrow 2x + 20 = 9x$$

$$20 = 7x \quad x = \frac{20}{7} = 2 \frac{6}{7}$$

5. One pump fills a tank twice as fast as another. If together they fill the tank in 20 minutes, how long does the larger pump take?

30 min

$$\text{small} + \text{large} = 1$$

$$\frac{1}{x} (20) + \frac{1}{2x} (20) = 1$$

$$\frac{20}{x} + \frac{20}{2x} = 1 \rightarrow \frac{40 + 20}{2x} = 1$$

$$60 = 2x$$

$$x = 30 \text{ min.}$$

6. A swimming pool has two inlet pipes. One fills the pool in 4 hours, the other in 6 hours. The outlet pipe empties the pool in 5 hours. Once the outlet pipe was left open when the pool was being filled. In how many hours was the pool full?

4 8/13 hours

$$\text{inlet 1} + \text{inlet 2} - \text{outlet} = 1 \text{ job}$$

$$\frac{1}{4} (t) + \frac{1}{6} (t) - \frac{1}{5} (t) = 1$$

7. Car travels 300 km in same time freight train travels 200 km. Car 20 km/h faster than train. Find rate car & train.

$$\frac{15t}{60} + \frac{10t}{60} - \frac{12t}{60} = \frac{60}{60}$$

$$13t = 60$$

$$t = 4.615$$

4 hours, 37 min.

40	60
Km/h	Km/h