

Date: _____

Name: _____

PRACTICE 2 Rational Word Problems

1. The sum of half a number and its reciprocal is the same as 51 divided by the number. Find the number.
2. Kirsten can type a 50-page paper in 8 hours. Last month Kirsten and Courtney, together, typed a 50-page paper in 6 hours. How long would it take Courtney to type a 50-page paper on her own.
3. It takes 10 hours to fill a pool with water, and 20 hours to drain it. If the pool is empty and the drain is open, how long would it take to fill the pool.
4. A box with no top has a square base and a volume of 125 m^3 . If the material for the bottom costs \$5 per square meter and \$2 per square meter for the sides, express the cost as a function of the base length. Find the dimensions of the box if the total cost was \$445.
5. It takes 8 hours to fill a tank with a particular chemical. Without treatment, all of the chemical in the tank would evaporate in 12 hours. If the tank is empty to start, and the chemical is not being treated as it enters the tank, how long will it take to have a full tank?
6. A certain company has fixed costs of \$40 000, and variable costs of \$2.60 per unit. If x is the number of units produced, find the average cost function. (The average cost is the cost of the units divided by the number of units) Find the horizontal asymptote of the average cost function. Explain what the asymptote means in this situation. Find how many units were produced if the average cost is \$66.60.
7. If pump A can fill a swimming pool in 3 hours and pump B can fill the same swimming pool in 2 hours, how long would it take pumps A and B to fill the pool if they worked together?
8. Ted has written several tests in Math and has an average of 75%. He calculates that if he gets 90% on his next test, his average will go up to 78%. How many tests will Ted then have written?"
9. A bricklayer's apprentice can finish a job in 8 hours whereas the bricklayer and his apprentice can finish the same job together in 2 hours. Approximately how long would it take the bricklayer to finish the same job alone (round to the nearest tenth of an hour)?

Date: _____

PRACTICE 2 Rational Word Problems

ANSWERS

Name: _____

1. The sum of half a number and its reciprocal is the same as 51 divided by the number. Find the number.

$$10 \text{ or } -10$$

2. Kirsten can type a 50-page paper in 8 hours. Last month Kirsten and Courtney, together, typed a 50-page paper in 6 hours. How long would it take Courtney to type a 50-page paper on her own.

$$24$$

3. It takes 10 hours to fill a pool with water, and 20 hours to drain it. If the pool is empty and the drain is open, how long would it take to fill the pool.

$$20$$

4. A box with no top has a square base and a volume of 125 m^3 . If the material for the bottom costs \$5 per square meter and \$2 per square meter for the sides, express the cost as a function of the base length. Find the dimensions of the box if the total cost was \$445.

$$8 \times 8 \times 1.95 \quad \text{or} \quad 2.4 \times 2.4 \times 21.7$$

5. It takes 8 hours to fill a tank with a particular chemical. Without treatment, all of the chemical in the tank would evaporate in 12 hours. If the tank is empty to start, and the chemical is not being treated as it enters the tank, how long will it take to have a full tank?

$$24$$

6. A certain company has fixed costs of \$40 000, and variable costs of \$2.60 per unit. If x is the number of units produced, find the average cost function. (The average cost is the cost of the units divided by the number of units) Find the horizontal asymptote of the average cost function. Explain what the asymptote means in this situation. Find how many units were produced if the average cost is \$66.60.

$$625$$

7. If pump A can fill a swimming pool in 3 hours and pump B can fill the same swimming pool in 2 hours, how long would it take pumps A and B to fill the pool if they worked together?

$$1.2$$

8. Ted has written several tests in Math and has an average of 75%. He calculates that if he gets 90% on his next test, his average will go up to 78%. How many tests will Ted then have written?"

$$4$$

9. A bricklayer's apprentice can finish a job in 8 hours whereas the bricklayer and his apprentice can finish the same job together in 2 hours. Approximately how long would it take the bricklayer to finish the same job alone (round to the nearest tenth of an hour)?

$$2.7$$