

Date: \_\_\_\_\_

Name: \_\_\_\_\_

## **PRACTICE 1 Rational Word Problems**

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1. A chemist's potion boils over and leaves a huge pool of potion in his laboratory. He knows that if he asks his apprentice to clean it up, it would take 20 minutes longer than if he did it himself. So he decides to have the apprentice help him do the job. Together, they clean the mess in 30 minutes. How long would it have taken if the chemist did the job alone?
2. Red Riding Hood drives the 432 miles to Grandmother's house in 1 hour less than it takes the Wolf to drive the same route. Her average speed is 6mph faster than the Wolf's average speed. How fast does each drive?
3. To get to work, Sam jogs 3 km to the train and then rides the remaining 5 km. If the train goes 40 km per hour faster than Sam's constant rate of jogging and the entire trip takes 30 minutes, how fast does Sam jog?
4. A radiator contains 10 quarts of fluid, 30% of which is antifreeze. How much fluid should be drained and replaced with pure antifreeze so that the new mixture is 40% antifreeze?
5. A person traveled 120 miles in one direction. The return trip was accomplished at double the speed and took 3 hours less the time. Find the speed going.
6. A certain company has fixed costs of \$40 000 and variable costs of \$2.50 per unit. Let  $x$  be the number of units produced. Find the rule of the average cost function. [The average cost is the cost of the units divided by the number of units]. If the average cost was \$22.50, how many units were produced?
7. The reciprocal of 4 plus the reciprocal of 5 is the reciprocal of what number?
8. One Halloween evening you and your friend counted the number of Snickers Bars you had each received as a result their trick-or-treat expedition. Your friend simply counted that he had received 7 Snicker Bars. You, being a math genius, noticed that if you divided 6 times the number of Snickers Bars that you received by five less than that number, you would have the square of the number of Snickers Bars that you had received. Who had more Snickers Bars?
9. A group of homeowners are to share equally in the \$210 cost of repairing a bus-stop shelter near their homes. At the last moment, two members of the group decide not to participate, and this raises the share of each remaining person by \$28. How many people were in the group at the beginning?

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10. Rowing at 8 km/h, in still water, Rima and Bhanu take 16 h to row the 39 km down a river and back. Find the speed of the current. (The equation is found for you below. Study the chart – as it shows how the set up will look for this type of problem)

	Distance	Speed	Time $T = \frac{D}{S}$
with the current speed, C	$39 \div 2 = 19.5$	$8 + C$	$\frac{19.5}{8 + C}$
against the current	19.5	$8 - C$	$\frac{19.5}{8 - C}$

Since it took 16 hours add the times for the equation to solve:

$$\frac{19.5}{8 + C} + \frac{19.5}{8 - C} = 16$$

11. A river flows at 2km/h, and John takes 6 hours to row 16 km trip up the river and back. How fast did he row? (set up similar to above question)
12. Ero and Jamal set off at the same time on a 30km walk for charity. Ero, who has trained all year for this event, walks 1.4km/h faster than Jamal, but sees a friend on the route and stops to talk for 20 min. Even with this delay, Ero finishes the walk 2 hrs ahead of Jamal. How fast was each person walking?

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ANSWERS Name: \_\_\_\_\_

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51.6

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48 and 54

3. To get to work, Sam jogs 3 km to the train and then rides the remaining 5 km. If the train goes 40 km per hour faster than Sam's constant rate of jogging and the entire trip takes 30 minutes, how fast does Sam jog?

7.6

4. A radiator contains 10 quarts of fluid, 30% of which is antifreeze. How much fluid should be drained and replaced with pure antifreeze so that the new mixture is 40% antifreeze?

1.43

5. A person traveled 120 miles in one direction. The return trip was accomplished at double the speed and took 3 hours less the time. Find the speed going.

20

6. A certain company has fixed costs of \$40 000 and variable costs of \$2.50 per unit. Let  $x$  be the number of units produced. Find the rule of the average cost function. [The average cost is the cost of the units divided by the number of units]. If the average cost was \$22.50, how many units were produced?

2000

7. The reciprocal of 4 plus the reciprocal of 5 is the reciprocal of what number?

$\frac{20}{9}$

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6  $\therefore$  your friend

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5

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6.7

11. A river flows at 2km/h, and John takes 6 hours to row 16 km trip up the river and back. How fast did he row? (set up similar to above question)

3.73

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3.6 and 5