

Boost Free Lessons - Year 8 Maths

Lesson 14: Rates

Name: _____ Grade: _____ Date: _____

Worked Example 1

A car travels 240 km in 3 hours. Find its speed in km/h.

1. A rate compares two quantities that have **different** units.
2. Speed is distance divided by time.
3. $240 \div 3 = 80$.
4. Write the units as part of the answer.

= 80 km/h

Worked Example 2

5 kg of apples cost \$12.50. Find the cost per kilogram.

1. "Per kilogram" means the cost of exactly 1 kg, so divide by the number of kilograms.
2. $12.50 \div 5 = 2.50$.
3. This is called a unit rate, because the second quantity is 1.

= \$2.50 per kg

Remember: A rate always keeps its units, written with "per" or a slash, such as km/h or \$/kg. To find a unit rate, divide so the second quantity becomes 1.



Question 1: Write each of these as a rate.

1. 180 km in 2 hours
2. \$24 for 6 kg
3. 500 words in 10 minutes
4. 350 km in 5 hours
5. \$45 for 9 tickets
6. 120 L in 8 minutes
7. 84 pages in 7 days
8. \$6.40 for 4 kg



Question 2: Answer the following questions.

1. A car travels at 60 km/h. How far does it go in 4 hours?
2. A tap fills at 12 L/min. How long does it take to fill 96 L?
3. A printer prints 25 pages per minute. How many pages in 6 minutes?
4. Petrol costs \$1.80 per litre. What is the cost of 45 L?
5. A cyclist rides 90 km in 4 hours. Find the speed.
6. A worker earns \$28 per hour. What is the pay for 7.5 hours?
7. A plane flies 2 400 km in 3 hours. Find the speed.
8. A tap leaks at 3 L per hour. How much water leaks in 2.5 days?



Question 3: Answer the following questions.

1. Which is better value: 2 kg for \$9, or 5 kg for \$21? Show your working.
2. A train travels 450 km in 5 hours. At the same speed, how long would 630 km take?
3. A tap fills a 300 L tank in 20 minutes. Find the rate in litres per minute.
4. Sam earns \$22 per hour and works 38 hours in a week. Find his weekly pay.
5. A car uses 8 L of petrol per 100 km. How much petrol is needed for a 350 km trip?





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Answers: Rates**Question 1**

- | | |
|-----------------|-----------------|
| 1. 90 km/h | 5. \$5/ticket |
| 2. \$4/kg | 6. 15 L/min |
| 3. 50 words/min | 7. 12 pages/day |
| 4. 70 km/h | 8. \$1.60/kg |

Question 2

- | | |
|--------------|--------------|
| 1. 240 km | 5. 22.5 km/h |
| 2. 8 minutes | 6. \$210 |
| 3. 150 pages | 7. 800 km/h |
| 4. \$81 | 8. 180 L |

Question 3

1. 5 kg for \$21 is \$4.20/kg, and 2 kg for \$9 is \$4.50/kg, so the 5 kg bag is better value
2. 90 km/h, so 630 km takes 7 hours
3. 15 L/min
4. \$836
5. 28 L

