Get Ready for Grade 9 Rate and Unit Rate Worked Examples and Practice

Example 1: Jozefina's Contracting paid $60 000 to have bathrooms installed in a 12-unit apartment building that was under construction. What was the unit rate per bathroom?

Solution: To find the unit rate, divide the cost by the number of units, and reduce to lowest terms.

$$\frac{60\,000}{12} = \$5000\,/\,\text{bathroom}$$

Example 2: Bryan expected that about 500 patients would attend his flu shot clinic. He brought 250 mL of flu vaccine to the clinic. What was the expected unit rate of vaccine per patient, expressed as a decimal?

Solution: To find the unit rate, divide the volume of vaccine by the number of patients, and convert to a decimal.

$$\frac{250}{500} = \frac{1}{2}$$
$$= 0.5\,\text{mL/patient}$$

Example 3: Basiruddin kept records showing that 30 of the 150 computers brought to him for repair in one month were infected with the XX77 virus. Express the rate of infection as a percent.

Solution: To find the infection rate as a percent, divide the number of computers infected by the total number of computers, and convert to a percent.

$$\frac{30}{150} = \frac{1}{5}$$
$$= 0.20$$
$$= 20\%$$

Example 4: Giselle rode her bicycle at a rate of 12 km/h for half an hour. How far did she go?

Solution: The unit rate is 12 km every hour. To find the total distance travelled, multiply the unit rate by the number of hours.

$$d = 12 \times 0.5$$
$$= 6\,\text{km}$$

Example 5: The management of an amusement park kept records to show that visitors lost personal items at a rate of 0.03 items/visitor. The park hosted 2500 visitors on a busy Saturday. How many lost items were expected?

Solution: The unit rate is 0.03 items per visitor. To find the expected number of lost items, multiply the unit rate by the number of visitors.

$0.03 \times 2500 = 75$

Example 6: The Moon Life Insurance company pays a claim on 1.5% of the policies that it underwrites. A total of 1200 new policies were underwritten during a month. How many claims are expected?

Solution: The unit rate is 1.5%. Convert this to a decimal, and multiply by the number of policies.

1.5% of $1200 = 0.015 \times 1200$
$\qquad\qquad\quad = 18$ claims

Practice:

1. Tom's Crispy Donut Shoppe sold 8400 donuts during its first week of operation. Tom's is open every day. Find the daily unit sales rate.

2. Maha's house is on a one-way street. She counted 24 automobiles passing in a one hour period. Of these, 3 went the wrong way down the street. What is the rate of cars going the wrong way, expressed as a decimal?

3. Of the 160 patients who made appointments to see a dentist in a week, 8 did not arrive for their appointments. Find the rate of "no-shows," expressed as a percent.

4. A light aircraft burns 35 L of fuel per hour. How much fuel is needed for a 2.4 hour flight?

5. A swimming pool manual recommends adding 0.0004 L of chlorine solution per litre of pool water. How much chlorine solution should be added to a pool with a volume of 5000 L?

6. The Real Time Watch Company expects that 0.2% of its watches will be returned for service under a one-year warranty. If 4500 watches were sold in a month, how many of those are expected to be returned for warranty service?

Answers:

1. 1200 donuts/day 2. 0.125 3. 5% 4. 84 L 5. 2 L 6. 9 watches.