

Finding Unit Rates When Quantities Are Fractions

Grade 7 math · Test Answer Key · Standards: 7.RP.A.1

Use this answer key to score the test. Each solution lists the steps and a scoring guide. Give partial credit when the setup is correct but an arithmetic slip changes the final number.

Standards: 7.RP.A.1 · **Level:** Grade 7

Question 1 Complex Fraction and Unit Rate (2 points)

(a) $\frac{3}{8}^{\frac{1}{12}}$ miles per hour.

(b) $\frac{3}{8} \times 12 = \frac{36}{8} = \frac{9}{2}$.

4 $\frac{1}{2}$ miles per hour

Scoring: 1 point for the complex fraction, 1 point for the correct speed.

Question 2 Leaky Pipe (2 points)

$\frac{7}{10} \div \frac{3}{8} = \frac{7}{10} \times \frac{8}{3} = \frac{56}{30} = \frac{28}{15}$.

1 $\frac{13}{15}$ quarts per hour

Scoring: 1 point for the correct setup, 1 point for the correct simplified answer.

Question 3 Skater or Runner (3 points)

Skater: $\frac{7}{10} \times 6 = \frac{42}{10} = 4 \frac{1}{5}$ mph.

Runner: $\frac{1}{2} \div 7 = \frac{1}{14}$ mi per min; $\times 60 = \frac{60}{14} = \frac{30}{7} = 4 \frac{2}{7}$ mph.

$4 \frac{2}{7} > 4 \frac{1}{5}$ because $\frac{10}{35} > \frac{7}{35}$.

The runner is faster

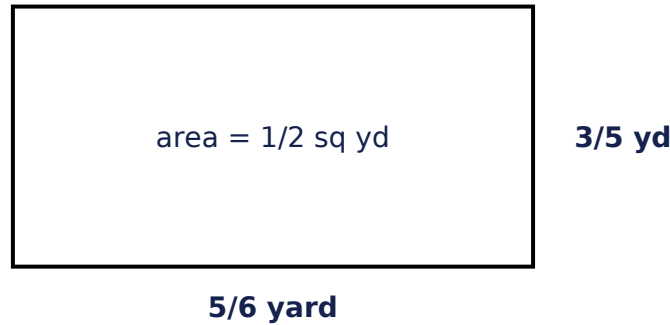
Scoring: 1 point for the skater's rate, 1 point for the runner's rate with the unit conversion, 1 point for the conclusion.

Question 4 Cleaning a Floor Section (2 points)

Area: $\frac{5}{6} \times \frac{3}{5} = \frac{15}{30} = \frac{1}{2}$ sq yd.

$$\frac{1}{2} \div \frac{1}{4} = 2.$$

2 square yards per hour



Area first, then divide by $\frac{1}{4}$ hour.

Scoring: 1 point for the area, 1 point for the rate.

Question 5 Walnut Prices (3 points)

(a) $8.40 \div \frac{3}{4} = 8.40 \times \frac{4}{3} = 33.60 \div 3 = \$11.20$ per pound.

(b) $11.20 \times 2.5 = 28.00$.

\$11.20 per pound; \$28.00

Scoring: 1.5 points for each part (1 for the method, 0.5 for the answer).

Question 6 Robot Speed Conversion (2 points)

Feet per second: $\frac{9}{10} \times 3 = \frac{27}{10}$.

Feet per minute: $\frac{27}{10} \times 60 = 162$.

162 feet per minute

Scoring: 1 point for feet per second, 1 point for the conversion.

Question 7 Filling a Tub (3 points)

(a) $\frac{2}{5} \div \frac{3}{4} = \frac{2}{5} \times \frac{4}{3} = \frac{8}{15}$ tub per minute.

(b) $1 \div \frac{8}{15} = \frac{15}{8} = 1 \frac{7}{8}$ minutes.

(c) Remaining $\frac{3}{5} \div \frac{8}{15} = \frac{3}{5} \times \frac{15}{8} = \frac{45}{40} = 1 \frac{1}{8}$ minutes. (Check: $1 \frac{7}{8} - \frac{3}{4} = 1 \frac{1}{8}$.)

$\frac{8}{15}$ tub per minute; $1 \frac{7}{8}$ min; $1 \frac{1}{8}$ min

Scoring: 1 point per part.

Question 8 Constant Rate Table (3 points)

(a) $\frac{5}{8} \div \frac{1}{3} = \frac{15}{8} = 1 \frac{7}{8}$ mph.

(b) 1 hour: $1 \frac{7}{8}$ mi. $2 \frac{1}{2}$ hours: $\frac{15}{8} \times \frac{5}{2} = \frac{75}{16} = 4 \frac{11}{16}$ mi.

(c) $\frac{15}{4} \div \frac{15}{8} = \frac{15}{4} \times \frac{8}{15} = 2$ hours.

$1 \frac{7}{8}$ mph; $1 \frac{7}{8}$ mi and $4 \frac{11}{16}$ mi; 2 hours

Time (h)	1/3	1	2 1/2
Distance (mi)	5/8	1 7/8	4 11/16

Completed table for Question 8.

Scoring: 1 point per part.