

3.4 Rates with Complex Fractions

PRACTICE

Divide the complex fractions. Reduce to simplest form if possible.

1. $\frac{\frac{3}{4}}{\frac{2}{5}} = \frac{3}{4} \div \frac{2}{5} = \frac{3}{4} \cdot \frac{5}{2} = \frac{15}{8}$

2. $\frac{\frac{4}{2}}{\frac{3}{3}} = \frac{4}{1} \div \frac{2}{3} = \frac{4}{1} \cdot \frac{3}{2} = \frac{12}{2} = 6$

3. $\frac{\frac{3}{7}}{\frac{5}{5}} = \frac{3}{7} \div \frac{5}{1} = \frac{3}{7} \cdot \frac{1}{5} = \frac{3}{35}$

Find the rate. LABEL YOUR ANSWER!

4. It rained $2\frac{3}{4}$ inches in 3 hours. What is the average amount of rain per hour?

$$2\frac{3}{4} \div 3 = \frac{11}{4} \div 3 = \frac{11}{4} \cdot \frac{1}{3} = \frac{11}{12}$$

$\frac{11 \text{ inches of rain}}{12 \text{ hours}}$

5. Dustin made $3\frac{1}{5}$ pies in $\frac{4}{5}$ of a day. What is the average amount of pies per day?

$$3\frac{1}{5} \div \frac{4}{5} = \frac{16}{5} \div \frac{4}{5} = \frac{16}{5} \cdot \frac{5}{4} = \frac{80}{20} = 4$$

$\frac{4 \text{ pies}}{1 \text{ day}}$

6. $2\frac{2}{3}$ pounds of peanuts cost you 4 dollars. What is the price per pound?

$$4 \div 2\frac{2}{3} = \frac{4}{1} \div \frac{8}{3} = \frac{4}{1} \cdot \frac{3}{8} = \frac{12}{8} = \frac{3}{2}$$

$\frac{3 \text{ dollars}}{1 \text{ pound}}$

The following are proportional. Find k (constant of proportionality)

7. x y

Time (min)	Distance (meters)
$1\frac{1}{2}$	$\frac{9}{4}$
3	$\frac{9}{2}$
5	$7\frac{1}{4}$

$$k = \frac{9}{2 \cdot \frac{1}{2}} = \frac{9}{1} \div 1 = 9$$

$$\frac{9}{2} \cdot \frac{1}{2} = \frac{9}{4} = \frac{9}{4}$$

8. x y

Gas (liters)	Distance (km)
2	$\frac{3}{2}$
$2\frac{1}{2}$	$\frac{15}{8}$
$\frac{4}{5}$	$\frac{3}{5}$

$$k = \frac{3}{2 \cdot \frac{1}{2}} = \frac{3}{1} \div 1 = 3$$

$$\frac{3}{2} \cdot \frac{1}{2} = \frac{3}{4} = \frac{3}{4}$$

9. x y

Gummy Bears (pound)	$\frac{1}{8}$	$\frac{12}{5}$	$3\frac{1}{2}$
Cost (dollars)	$\frac{5}{24}$	4	$\frac{35}{6}$

$$k = \frac{4}{\frac{1}{2} \cdot \frac{1}{2}} = 4 \div \frac{1}{4} = 16$$

$$\frac{4}{1} \cdot \frac{1}{4} = \frac{4}{4} = 1$$

The following are proportional. Find k (constant of proportionality) and complete the sentence.

Fill in the table

10. Caitlyn can swim 12 laps in $\frac{1}{4}$ hours. Find her average speed in laps per hour?

$$\frac{12}{\frac{1}{4}} = 12 \div \frac{1}{4} = \frac{12}{1} \cdot \frac{4}{1} = \boxed{48}$$

$$\frac{48}{1} \cdot \frac{2}{3} = \frac{96}{3} = 32$$

Time (hours)	Laps (#)
$\frac{1}{4}$	12
$\frac{2}{3}$	32

In $\frac{2}{3}$ hours, Caitlyn swims 32 laps.

11. Joey packed $2\frac{1}{4}$ boxes in $\frac{1}{4}$ hours. Find the average speed in boxes per hour.

$$\frac{2\frac{1}{4}}{\frac{1}{4}} = \frac{9}{4} \div \frac{1}{4} = \frac{9}{4} \cdot \frac{4}{1} = \frac{36}{4} = \boxed{9}$$

$$9 \cdot 3 = 27$$

Time (hours)	Boxes Packed (#)
$\frac{1}{4}$	$2\frac{1}{4}$
3	27

In 3 hours, Joey packs 27 boxes.

12. You buy $2\frac{3}{4}$ yards of fabric for $4\frac{1}{2}$ dollars. Find the price per yard of fabric.

$$\frac{2\frac{3}{4}}{4\frac{1}{2}} = \frac{11}{4} \div \frac{9}{2} = \frac{11}{4} \cdot \frac{2}{9} = \frac{22}{36} = \boxed{\frac{11}{18}}$$

$$\frac{11}{8} \cdot \frac{1}{2} = \frac{11}{16}$$

Length (yard)	Cost (\$)
$2\frac{3}{4}$	$4\frac{1}{2}$
$\frac{1}{2}$	$\frac{11}{16}$

You buy $\frac{1}{2}$ a yard of fabric for $\frac{11}{16}$ dollars.

13. Sophie can read $\frac{3}{4}$ pages in $\frac{3}{5}$ minutes. Find the average speed she can read in pages per minute.

$$\frac{\frac{3}{4}}{\frac{3}{5}} = \frac{3}{4} \div \frac{3}{5} = \frac{3}{4} \cdot \frac{5}{3} = \frac{15}{12} = \boxed{\frac{5}{4}}$$

$$\frac{5}{4} \cdot \frac{8}{3} = \frac{40}{12} = \frac{10}{3}$$

$$\frac{8}{3} =$$

Time (min)	Pages Read (#)
$\frac{3}{5}$	$\frac{3}{4}$
$2\frac{2}{3}$	$\frac{10}{3}$

Sophie reads $\frac{10}{3}$ pages in $2\frac{2}{3}$ minutes.