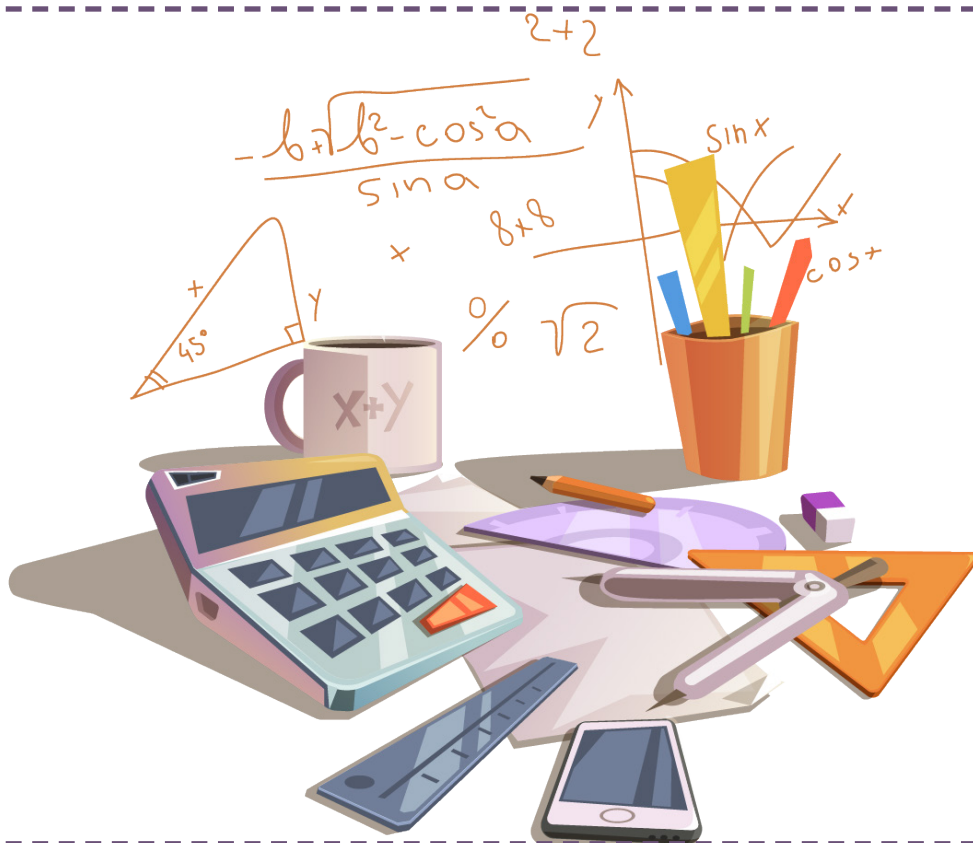


Write Ratios as Fractions in Simplest Form



Converting Ratios to Fractions



Vocabulary A-Z

Let us learn some vocabulary

Ratio

is a comparison of two quantities by division.

If a gallon of paint contains 2 parts red paint and 4 parts white paint, then the ratio comparing the red paint to the white paint can be written as follows.

2 to 4 2 : 4



Rate

is a ratio of two quantities having different kinds of units.

Miles and hours
are different kind
of units

65 miles in 3 hours

Dollars and pounds are
different kinds of units

\$16 for 2 pounds

Unit Rate

When a rate is simplified so that it has a denominator of 1, it is called a unit rate.

An example of a unit
rate is 35 THB per \$1
US Dollar.





Let's Begin

Write Ratios in Simplest Form



Express the ratio 10 roses out of 12 flowers as a fraction in simplest form.

$$\begin{array}{c} \div 2 \\ \curvearrowright \\ \frac{10}{12} = \frac{5}{6} \\ \curvearrowleft \\ \div 2 \end{array}$$

Divide the numerator and denominator by the GCF, 2.

The ratio of roses to flowers is 5 to 6. This means that for every 6 flowers, 5 of them are roses.

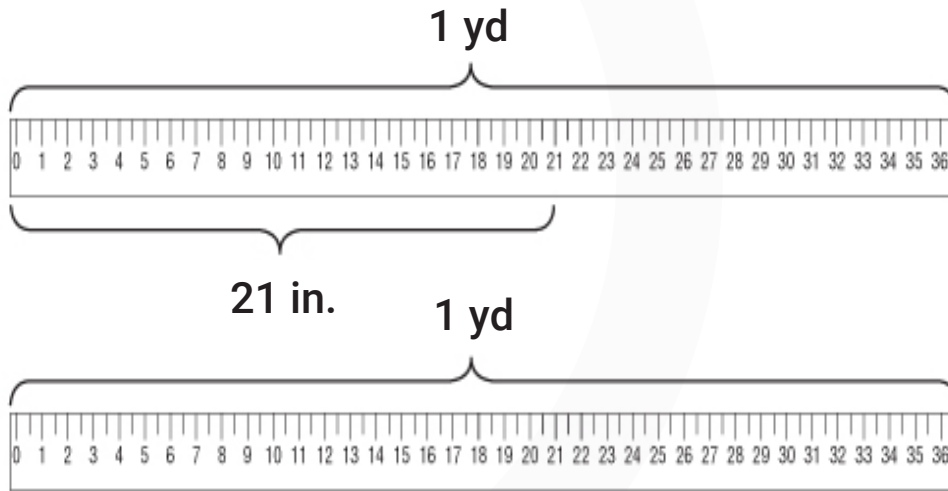
ANSWER

$$\frac{5}{6}$$

5 : 6

Write Ratios as Fractions

Express the ratio 21 inches to 2 yards as a fraction in simplest form.



$$\frac{21 \text{ inches}}{2 \text{ yards}} = \frac{21 \text{ inches}}{72 \text{ inches}} \quad \text{Convert 2 yards to inches.}$$

$$= \frac{\cancel{21} \text{ inches}}{\cancel{72} \text{ inches}} \quad \text{Divide the numerator and denominator by the GCF, 3.}$$

Written in simplest form, the ratio is 7 to 24.

ANSWER

$$\frac{7}{24} \quad 7 : 24$$

Compare Units Rates



SHOPPING

A 12-oz bottle of cleaner costs \$4.50. A 16-oz bottle of cleaner costs \$6.56. Which costs less per ounce?

Find and compare the unit rates of the bottles.

$$\frac{\$4.50}{12 \text{ ounces}} = \frac{\$0.38}{1 \text{ ounces}}$$

Divide the numerator and denominator by 12 to get a denominator of 1.

For the 12-oz bottle, the unit rate is \$0.38 per ounce.

$$\frac{\$6.56}{16 \text{ ounces}} = \frac{\$0.41}{1 \text{ ounces}}$$

Divide the numerator and denominator by 16 to get a denominator of 1.

For the 16-oz bottle, the unit rate is \$0.41 per ounce.

ANSWER

The 12-oz bottle has the lower cost per ounce.

Convert Rates

ANIMALS

A snail moved 30 feet in 2 hours. How many inches per minute did the snail move?



You will need to convert $\frac{30 \text{ ft}}{2 \text{ hr}}$ to $\frac{\blacksquare \text{ in.}}{1 \text{ min}}$

There are 12 inches in 1 foot and 60 minutes in 1 hour.

Write 30 feet in 2 hours as $\frac{30 \text{ ft}}{2 \text{ hr}}$

$$\frac{30 \text{ ft}}{2 \text{ hr}} = \frac{30 \text{ ft}}{2 \text{ hr}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \div \frac{60 \text{ min}}{1 \text{ hr}}$$

$$\frac{30 \text{ ft}}{2 \text{ hr}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \quad \text{The reciprocal of } \frac{60 \text{ min}}{1 \text{ hr}} \text{ is } \frac{1 \text{ hr}}{60 \text{ min}}$$

$$\frac{\cancel{30}^1 \text{ ft}}{\cancel{2}^1 \text{ hr}} \cdot \frac{\cancel{12}^3 \text{ in}}{\cancel{1} \text{ ft}} \cdot \frac{\cancel{60}^2 \text{ min}}{\cancel{1} \text{ hr}} \quad \text{Divide the common factors and units.}$$

$$= \frac{3 \text{ in.}}{1 \text{ min}} \quad \text{Simplify.}$$

ANSWER

30 feet in 2 hours is equivalent to 3 inches per minute.



Your Turn!

Write Ratios in Simplest Form

Express the ratio 8 golden retrievers out of 12 dogs as a fraction in simplest form.

A. $\frac{3}{2}$

B. $\frac{4}{6}$

C. $\frac{8}{12}$

D. $\frac{2}{3}$

Write Ratios as Fractions

Express the ratio 4 feet to 18 inches as a fraction in simplest form.

A. $\frac{2}{9}$

B. $\frac{8}{3}$

C. $\frac{48}{18}$

D. $\frac{24}{9}$

Compare Units Rates

SHOPPING

A 6-pack of a soft drink costs \$1.50. A 12-pack of a soft drink costs \$2.76. Which pack costs less per can?

- A. The 12-pack costs less per can.
- B. The 6-pack costs less per can.
- C. Both packs cost the same per can.
- D. Cannot be determined from the given information.



Convert Rates

JOGGING

Dave jogs 2 miles in 22 minutes. How many feet per second is this?

- A. $\frac{11 \text{ ft}}{\text{s}}$
- B. $\frac{8 \text{ ft}}{\text{s}}$
- C. $\frac{968 \text{ ft}}{\text{s}}$
- D. $\frac{3 \text{ ft}}{\text{s}}$





Skill Practice

Express each ratio as a fraction in simplest form

1. 8 pencils out of 12 pens

2. 42 textbooks to 28 students

3. 27 rooms to 48 windows

4. 15 angel fish to 75 fish

5. 75 cats to 100 dogs

6. 6 aces out of 24 serves

7. 3 gallons to 15 quarts

8. 30 feet to 11 yards

Express each ratio as a unit rate. Round to the nearest tenth or nearest cent, if necessary.

9. \$9 for 6 cans of soup
bananas

10. \$39 for a case of 75

11. 108 miles in 6 days

12. 51 meters in 8 seconds

Convert each rate using dimensional analysis.

13. $12 \text{ m /min} = \underline{\quad} \text{ cm /s}$

14. $8 \text{ qt/min} = \underline{\quad} \text{ gal/h}$

15. $44 \text{ yd/s} = \underline{\quad} \text{ mi/h}$