

Unit Rates

Rate - Compares 2 quantities in different units

Unit Rate - A rate with a denominator of $\underline{\underline{1}}$

ex) 100 words in 2 minutes (Rate)

$$\rightarrow \frac{100 \text{ words}}{2 \text{ minutes}}$$

* To find a Unit Rate \rightarrow Divide *

$$100 \div 2 = \frac{50 \text{ words}}{1 \text{ minute}} \text{ (Unit Rate)}$$

Key Word: Per
(Per = Divide)

50 words per minute

Which brand of peanut butter has the lowest price per ounce?

Peanut Butter Sales	
Brand	Sale Price
Nutty	12 ounces for \$2.19
Grandma's	18 ounces for \$2.79
Bee's	28 ounces for \$4.69
Save-A-Lot	40 ounces for \$6.60

Nutty
 $2.19 \div 12 =$
 0.1825
 18¢

Bee's
 $4.69 \div 28$
 0.1675
 17¢

G-ma's
 $2.79 \div 18$
 0.155
 16¢

S.A.L.
 $6.60 \div 40$
 0.165
 17¢

Unit Rates With Fractions

****USE the ABC button on your calculator****

Example:

Paige mows $\frac{1}{6}$ acres in $\frac{1}{4}$ hour. How many acres does she mow per hour?

$$\frac{1}{6} \div \frac{1}{4} = \frac{2}{3} \text{ acres per hour}$$

Finding Total Price

If bananas cost \$0.49 per pound and you buy 3 pounds, what is the total cost of the bananas?



$$0.49 \times 3 = \$1.47$$

Amusement park tickets are \$45 a piece. If Julie has \$300 does she have a enough money to buy 7 tickets?

**Option 1**

$$\$45 \times 7 \text{ tickets}$$

$$\$315$$

No. She doesn't
have enough money

Option 2

$$\$300 \div \$45$$

$$6.\overline{66} \text{ Tickets}$$

She only has
enough money to
buy 6 tickets

Proportions

Proportional - Quantities that have the
Same unit rate (constant Rate)

Non-proportional - Quantities that do NOT
have the Same unit rate
(Not constant)

Solving Proportions

Is it proportional? - Same unit Rate

1. $\frac{3}{4}$ and $\frac{9}{12}$ 36

$\frac{3}{4} \times 3 = \frac{9}{12}$

$\frac{3}{4} = .75$ $\frac{9}{12} = .75$

Yes

2. $\frac{7}{3}$ and $\frac{12}{5}$ 36

$\frac{7}{3} = 2.\bar{3}$ $\frac{12}{5} = 2.4$

No

Example | Steps

$$\frac{x}{7} = \frac{12}{52}$$

$$\frac{52x}{52} = \frac{84}{52}$$

$$\boxed{18/13}$$

$$\approx 1.6$$

1. Cross Multiply

2. Divide by the Coefficient

↳ the # before a variable

A boat travels 187 miles in 4 hours. How far can it travel in 8 hours?

Miles
hours

$$\frac{187}{4} = \frac{X}{8}$$

$$4x = \frac{1496}{4}$$

$$x = 374 \text{ miles}$$

1. 18 pounds of potatoes cost \$216. How many pounds of potatoes can you get with \$120?

Proportion

$$\frac{18 \text{ lbs.}}{\$216} = \frac{X}{\$120}$$

$$\frac{2160}{216} = \frac{216x}{216}$$

$$x = 10 \text{ lbs}$$

Unit Rate

Cost per pound

$$216 \div 18 = \$12 \text{ per pound}$$

$$120 \div 12 = 10 \text{ lbs}$$

40 kg of tomatoes cost \$480. How much would 8 kg cost?

Cost per Kg
 $480 \div 40 = \$12 \text{ per Kg.}$

$$12 \times 8 = \$96$$

$$\frac{40 \text{ kg}}{\$480} = \frac{8 \text{ kg}}{X}$$

If 18 plums weigh 54 ounces, then 27 plums weigh how many ounces?

Ounces per Plum

$$54 \div 18 = 3$$

$$27 \times 3 = 81 \text{ ounces}$$

$$\frac{18 \text{ plums}}{54 \text{ oz}} = \frac{27 \text{ pl.}}{X \text{ oz}}$$