

# test ratios - example

1) unit rate - calculate

3 pens cost \$20. What is the unit rate to the nearest cent?

$$3 \overline{)20} \begin{array}{r} 6.66 \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \end{array} \rightarrow \boxed{\$6.67}$$

2) unit ratio compare

What is a better deal, 7 for \$2.51 or 11 for \$4.07?

$$\$4.07 \div 11 = 37¢ \quad \$2.51 \div 7 = 35.8 \rightarrow 36¢$$

$\uparrow$   
 $\boxed{\text{better deal}}$

3) unit rate: fraction to fraction

If I go  $\frac{3}{4}$  of a mile in  $\frac{1}{8}$  of an hour, what is my speed in miles per hour?

$$\frac{\frac{3}{4}}{\frac{1}{8}} = \frac{3}{4} \times \frac{8}{1} = \frac{24}{4} = \boxed{\frac{4 \text{ miles}}{\text{hr}}}$$

(multiplication equal division by the reciprocal)

4) ratio: missing entry in table

3	5	
?	15	← 9
12	?	← 20

## test-ratios - example continued

- 3) find equivalent ratio: reduce  
The ratio of Duke to UNC fans in D2 is 12:30. Reduce to most basic whole number rate

$$12:30 = 2 \cdot 6 : 5 \cdot 6 = \boxed{2:5}$$

- 6) My recipe calls 2 ounces of spider webs per 3 ounces of bat wings. How much of each do I need for a half batch.

$$2:3 \rightarrow \frac{2}{2} : \frac{3}{2} = 1 : 1\frac{1}{2}$$

- 7) Unit rate: switch to time per mile  
Julie walks  $\frac{1}{3}$  mile every  $\frac{1}{4}$  hour.

What is her time needed per mile?

$$\frac{\frac{1}{4} \text{ hour}}{\frac{1}{3} \text{ mile}} \rightarrow \frac{? \text{ hours}}{1 \text{ mile}}$$

\*3 relationship

$$\frac{1}{4} \times 3 = \frac{3}{4}$$

$\frac{3}{4} \text{ hour}$
$1 \text{ mile}$

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8) double ratio

There are 3 widgets for every 5 gizmos.

There are 7 gizmos for every 4 doodads.

What is the ratio of widgets to doodads?

find common denominator

$$3:5$$

$$7:4$$

$$\times 7 \quad 21:35$$

$$\times 5 \quad 35:20$$

Put together

21 widgets : 35 gizmos : 20 doodads

21 widgets : 20 doodads

9) unit rate - 2 step problem

If 6 pens cost \$15, how many pens can I buy for \$27.50?

$$15 \div 6 = 2.50$$

$$27.50 \div 2.50 = \boxed{11}$$

10) unit rate: profit per item

You buy 20 widgets for \$300. You sell the 20 widgets for \$450. How much profit do you make per widget?

Method 1

cost per widget  $\$300 \div 20 = \$15$

sale price

$$450 \div 20 = \$22.50$$

$$\text{profit} = 22.50 - 15 = \boxed{\$7.50}$$

Method 2:

$$\text{total profit} = \text{sales} - \text{cost} = 450 - 300 = \$150$$

$$\text{profit per widget} = \frac{\$150}{20} = \boxed{\$7.50 / \text{widget}}$$