Representing Proportional Relationships as Equations

The equation y = mx or y = kx is a _____ equation.

To be proportional, when x = 0, then _____ , also.
This means that on a graph, it passes through the_____, which is always point (0, 0).

The equation:

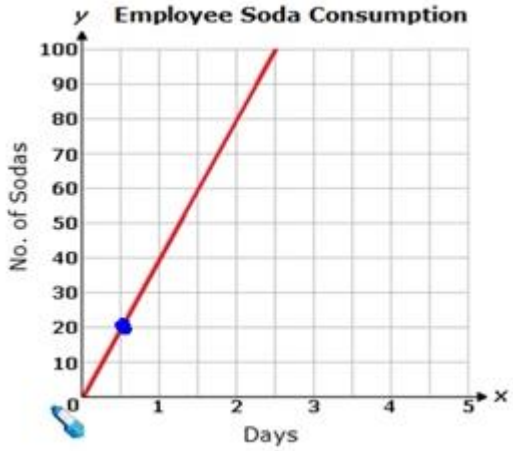
- y = mx (which can also be written as y = kx).
- "m" is also known as:

1. Slope

2. _____ _____ _____

3. Unit Rate

Remember!!
To find slope, constant of proportionality, unit rate, or "m" you must divide the _____ by the _____ or you can divide ____ by ____.

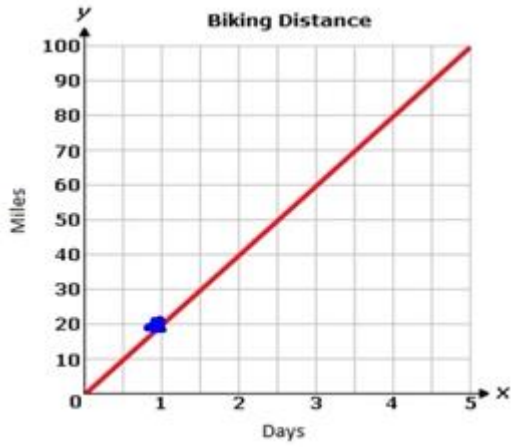


What are the (x, y) points represented by the blue dot on the line?

(_____ , _____)

Now, let's find the constant!

m = $\frac{y}{x}$ m = _____



The value of "*x*" is ____ and the value of *"y"* is _____.
Write the ordered pair of the blue dot (___ , ___)

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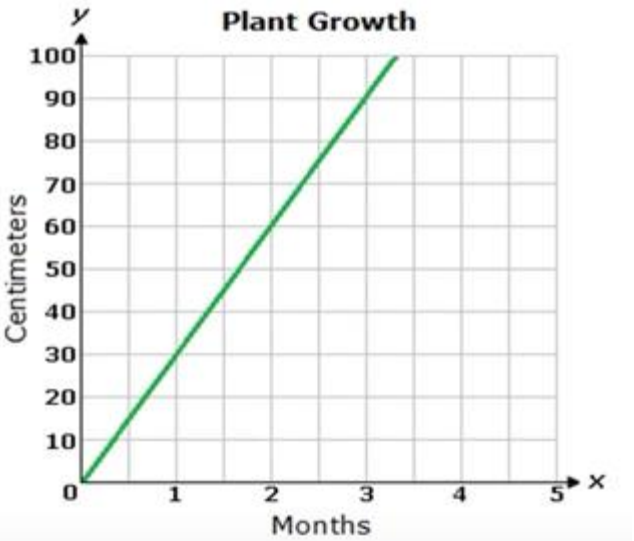
The ordered pair (1, 20) means that in ___ day, the total biking distance is _____.

The total number of eggs, T, collected in one day from a chicken coop is proportional to the number of chickens, C, in the coop. If each chicken laid the same number of eggs, 4, write an equation that could be used to find the total number of eggs collected from the coop?

T = the total number of _____

___ = the number of chickens.

Constant = each chicken laid the _____ number of eggs, 4.



The total number of eggs, T, is _____ to the number of chickens, C.

y = *mx* so, T = _____

Pick any two points that falls on the line and write the point below:
(___ , ___)

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(___ , ___)

What is the constant of proportionality?

What is the relationship between months, centimeters, and plant growth?

1. **After 2 hours, the air temperature had risen 7°F. Write and solve a proportion to find the amount of time it will take at this rate for the temperature to rise an additional 13°F.**

Write a proportion. Let t represent the time in hours.

temperature → $\frac{7}{2} = \frac{13}{t}$ ← temperature
time → time ←

$7 \cdot t = 2 \cdot 13$ Find the cross products.

$7t = 26$ Multiply

$\frac{7t}{7} = \frac{26}{7}$ Divide each side by 7.

$t \approx 3.7$ Simplify.

It will take about 3.7 hours to rise an additional 13°F.

Try the problem below with a partner.

2. If the ratio of Type O to non-Type O donors at a blood drive was 37:43, how many donors would be Type O, out of 300 donors?

Type O donors → $\frac{37}{37 + 43}$ or $\frac{37}{80}$
total donors →

Write a proportion. Let t represent the number of Type O donors.

Type O donors → $\frac{37}{80} = \frac{t}{300}$ ← Type O donors
total donors → ← total donors

$37 \cdot 300 = 80t$ Find the cross products.

$11{,}100 = 80t$ Multiply.

$\frac{11{,}100}{80} = \frac{80t}{80}$ Divide each side by 80.

$138.75 = t$ Simplify.

There would be about 139 Type O donors.

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Try the problem below with a partner.

Evarado paid $1.12 for a dozen eggs at his local grocery store. Determine the cost of 3 eggs.

3. **Olivia bought 6 containers of yogurt for $7.68. Write an equation relating the cost *c* to the number of yogurts *y*. How much would Olivia pay for 10 yogurts at this same rate?**

Find the unit rate between cost and containers of yogurt.

$\frac{\text{cost in dollars}}{\text{containers of yogurt}} = \frac{7.68}{6}$ or $1.28 per container

The cost is $1.28 times the number of containers of yogurt.

$c = 1.28y$ Let c represent the cost. Let y represent the number of yogurts.

$= 1.28(10)$ Replace y with 10.

$= 12.80$ Multiply.

The cost for 10 containers of yogurt is $12.80.

Try the problem below with a partner.

Trina earns $28.50 tutoring for 3 hours. Write an equation relating her earnings *m* to the number of hours *h* she tutors. Assuming the situation is proportional, how much would Trina earn tutoring for 2 hours? for 4.5 hours? (Examples 3 and 4)

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