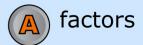




A proportion is an equation stating that two ____ are equal.











Solve this proportion:

$$\begin{array}{ccc} 2 & = & x \\ 3 & & 15 \end{array}$$

Text in your answer for x



Solve this proportion:

Text in the answer for n.



Solve:

 $\frac{42}{63} = \frac{6}{k}$











Why Learn This?

Researchers use the *capture/recapture method* to estimate animal population size. They collect, mark, and release animals. Then they capture another group of animals. The number of marked animals in the second group indicates the population size.

The following proportion is used to estimate a deer population.



 $\frac{\text{number of marked deer counted}}{\text{total number of deer counted}} = \frac{\text{total number of marked deer}}{\text{estimate of deer population}}$

EXAMPLE Using the Capture/Recapture Method



Gridded Response Researchers count 48 marked deer and a total of 638 deer on a flight over an area. They know there are 105 marked deer. Write a proportion to estimate the deer population in the area.

<u>number of marked deer counted</u> <u>total number of marked deer</u> total number of deer counted estimate of deer population

$$\frac{48}{638} = \frac{105}{x}$$

← Write a proportion.

$$48x = 105 \cdot 638$$

 $48x = 105 \cdot 638 \leftarrow \text{Write the cross products.}$

$$48x = 66,990$$

← Multiply.

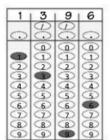
$$\frac{48x}{48} = \frac{66,990}{48}$$

← Divide each side by 48.

$$x \approx 1,396$$

← Round to the nearest integer.

There are about 1,396 deer.



Watch a short video clip

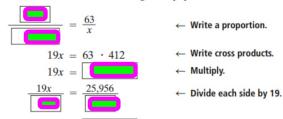
If you are looking at this lesson from the website, you can log into your online textbook and find the video under online resources for lesson 8-2 (homework video tutor)

http://www.pearsonsuccessnet.com/snpapp/iText/products/1-25-698758-1/media/academy123 content/wl-

Example

1 Using the Capture/Recapture Method Researchers know that there are 63 marked gazelles in an area. On a flight over the area, they count 19 marked gazelles and a total of 412 gazelles. Write a proportion to estimate the gazelle population.

 $\frac{\text{number of marked gazelles counted}}{\text{total number of gazelles counted}} = \frac{\text{total number of marked gazelles}}{\text{estimate of gazelle population}}$



 \leftarrow Round to the nearest integer.

There are about gazelles in the area.

Check: You can use an estimate to check your answer.

$$\frac{19}{412} \approx \frac{1}{400}$$
, or $\frac{1}{20}$

$$\frac{1}{20} = \frac{63}{x}$$

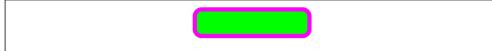
$$x = 63 \times 20 = 1,260$$

Since this is close to 1,366, the answer is reasonable.

Quick Check

Table talk about this one:

 Researchers know that there are 105 marked deer in an area. On a flight over the area, they count 35 marked deer and a total of 638 deer. Estimate the total deer population in the area.



You can power down your clickers and put them away.

Your assignment is a google form - check your email

Estimating population size - you will want your calculator.

Practice 8				Estimating Popu	ulation Size
			, tagged, and set free the species shown		imals
animals shown	er that same year, the worke in the table below and count on to estimate the park popu		ted the tagged animals. dation of each species.	Squirrels Raccoons	12 50 23
	Caught	Counted Tagged	Estimated Population	Rabbits	42
1. Bears	30	9	ropulation	Trout	46
2. Squirrels	1,102	28		Skunks	21
3. Raccoons	412	10			
4. Rabbits	210	2			
5. Trout	318	25			
6. Skunks	45	6	1		
	6 animals are t	agged	10. 5 out of 63 ar	nimals are tagged	
9. 8 out of 11			-		
9. 8 out of 11	on to estimate	each animal p	opulation.		
Use a proportion 11. Total duck Marked du		00	12. Total alligate Marked allig	ors counted: 310 ators counted: 16 d alligators: 90	