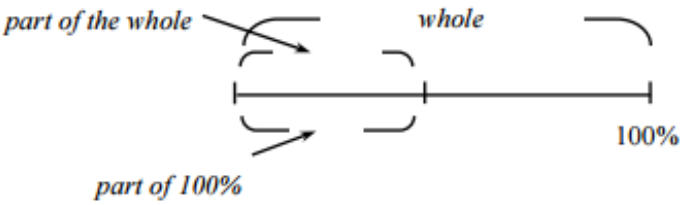
Name _____ Math ____ Date _____

PERCENT PROBLEMS USING DIAGRAMS 5.1.1 and 5.1.2

A variety of percent problems described in words involve the relationship between "the percent," "the part" and "the whole." When this is represented using a number line, solutions may be found using logical reasoning or equivalent fractions (proportions). These linear models might look like the diagram at right.

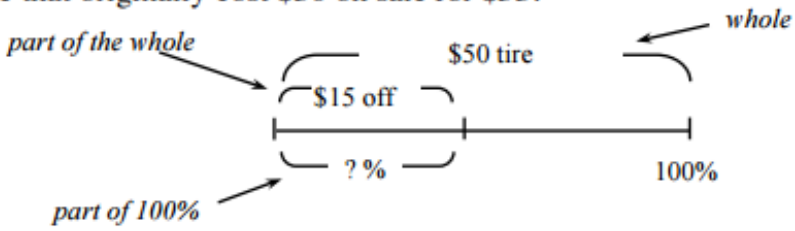


For additional information, see the Math Notes box in Lesson 5.1.2 of the *Core Connections, Course 2* text.

Example 1

Sam's Discount Tires advertises a tire that originally cost $50 on sale for $35. What is the percent discount?

A possible diagram for this situation is shown at right:

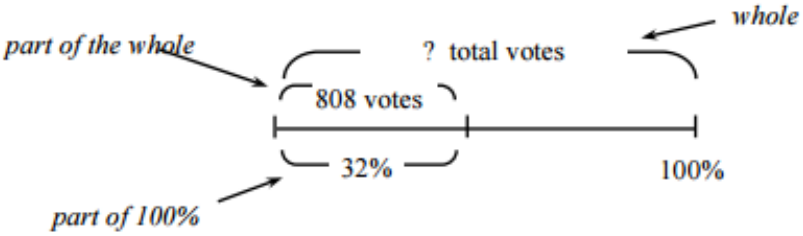


In this situation it is easy to reason that since the percent number total (100%) is twice the cost number total ($50), the percent number saved is twice the cost number saved and is therefore a 30% discount. The problem could also be solved using a proportion $\frac{15}{50} = \frac{?}{100}$.

Example 2

Martin received 808 votes for mayor of Smallville. If this was 32% of the total votes cast, how many people voted for mayor of Smallville?

A possible diagram for this situation is shown at right:



In this case it is better to write a pair of equivalent fractions as a proportion: $\frac{808}{32} = \frac{x}{100}$.

If using the Giant One, the multiplier is $\frac{100}{32} = 3.125$ so $\frac{808}{32} \cdot \frac{3.125}{3.125} = \frac{2525}{100}$.
A total of 2525 people voted for mayor of Smallville.

Note that the proportion in this problem could also be solved using cross-multiplication.

For each problem:

- Create a linear model (as shown in the examples), filling in the information given in the problem.
- Show your calculations and answer the question asked.

1. Sarah's English test had 90 questions and she got 18 questions wrong. What percent of the questions did she get *correct*?

2. Cargo pants that regularly sell for $36 are now on sale for 30% off. How much is the *discount*?

3. The bill for a stay in a hotel was $129.60 including 8% tax. What was the *original* bill (without tax)?

4. Alicia got 60 questions correct on her science test. If she received a score of 75%, how many questions were on the test?

5. A $65 coat is now on sale for $52. What *percent discount* is given?