Sales, Distribution, and Marketing Operations (52.1801) T-Chart

Make business decisions = **Summarize, represent, and interpret data on two categorical and quantitative variables**

Program Task: Analyze marketing research.

PA Core Standard: CC.2.4.HS.B.2

Description: Summarize, represent, and interpret data on two categorical and quantitative variables.

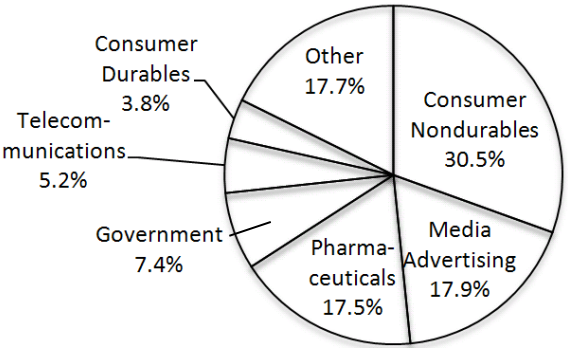
Program Associated Vocabulary:
DATA ANALYSIS, FORCED CHOICE QUESTIONS, RESEARCH REVENUE, PROJECTION, PRIMARY DATA, SURVEY METHOD

Math Associated Vocabulary:
CIRCLE GRAPH, LINE GRAPH, BAR GRAPH

Program Formulas and Procedures:
In the field of Marketing and Business, managers must read graphs and information to make predictions, analyze data and make decisions concerning new product launches, advertising media, and market research.

Example:
Marketing research is used by sole proprietorships and major corporations. The amount of money spent by the company on the research depends on the size and purpose of the information needed by the company.

Percentage of Market Research Revenue



Example 1:
The total dollars spent annually on marketing research is 4.7 billion. What is the dollar amount spent by Telecommunications?

Answer:
(0.052)(4,700,000,000) = $244,400,000

Example 2:
The total dollars spent annually on marketing research is 4.7 billion. The pharmaceutical industry is working to find a cure for breast cancer and will increase the amount it spends on marketing research by $650,000. What is the total dollar spent by the industry?

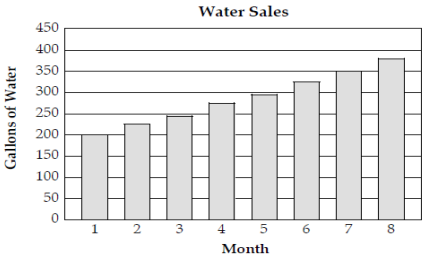
Answer:
(0.175)(4,700,000,000) = $822,500,000
822,500,000 + 650,000 = $823,150,000

Formulas and Procedures:
Predictions can be made from information presented in graphs by estimating or calculating. Common types of graphs include circle (pie) graphs, line graphs, and bar graphs. The process for making predictions depends upon the type of graph. A circle graph requires an understanding of percentages. Bar graphs are used to compare amounts. Line graphs are used to show trends.

Circle Graphs:
If 170 students selected the piano as their favorite musical instrument, approximately how many students were surveyed?

1. Read and comprehend the graph.
   30%, or 170 of the total students surveyed chose the piano
2. Translate the problem into an algebraic expression.
   30% of the students is 170. →
   0.30(s) = 170
3. Solve for the unknown variable.
   $0.30s = 170 \rightarrow \frac{0.30s}{0.30} = \frac{170}{0.30} \rightarrow s = 566.\overline{66}$
   Approximately 567 students were surveyed

Bar Graphs:
By what percentage did water sales increase between the first and eighth months?



1. Read and comprehend the graph.
   The graph shows the number of gallons of water sold each month over an 8 month period.
2. Determine the amount of change.
   Month 1 = 200 gallons, Month 8 ≈ 375 gallons
   375-200 = 175
3. Calculate percentage of increase.
   175/200 = .875 or 87.5%

Instructors Script - Comparing and Contrasting

In some text books, the information is frequently presented in a table, rather than a circle graph. Making predictions using circle graphs relies heavily on the ability to perform calculations with percentages.

To increase the rigor of the problem, a teacher may omit the percentage for one of the categories or select from a variety of question stems.

Omit the percentage for one of the categories

- Because the percentage is omitted, students must recognize that a circle graph depicts part of a whole and all of the percentages must add up to 100%.

Select from a variety of question stems

- What amount is allocated for (name of category)?
- How many (subject of the graph) selected or are allocated for ___ and ___? (combine two categories)
- If the total (subject of graph) was unknown, but category ___ was (value), what would be the total?
- If category ___ increased from ___% to ___%, what would be the increase of (subject of graph)?

Common Mistakes Made By Students

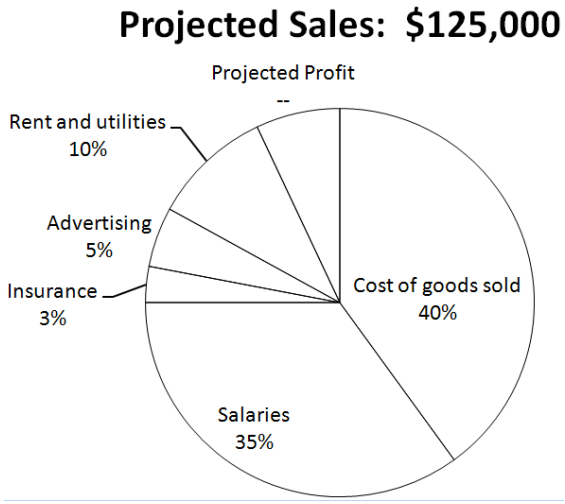
Incorrectly converting percents to decimals:

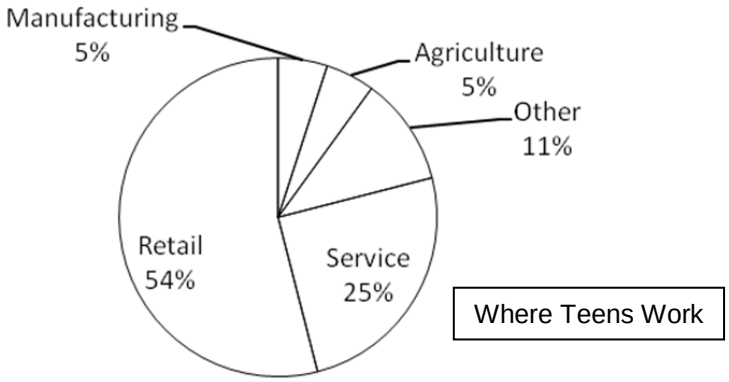
Many of the mistakes students make when converting percentages to decimals involve one or 3 digit numbers. For instance, students mistakenly write 6% as 0.6 instead of 0.06 or they write 125% as 0.125 instead of 1.25.

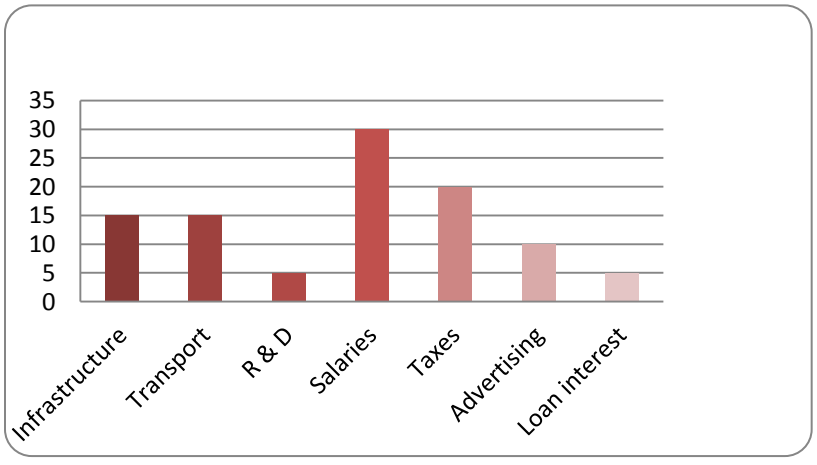
Incorrect computation with percentages: Write an algebraic expression from the information provided. Use key words to determine the appropriate operation. For instance, "of" means "x"; "is" means "=." Students who do not write algebraic expressions have a tendency to divide when they should multiply and vice versa.

CTE Instructor's Extended Discussion

Reading and understanding information in graph format is a necessary skill for a student in Marketing and Business Education. Graphs are used in presentations both internally and externally. These tools help executives make important decisions and can be used to chart a company's growth as well as employee performance.

Problems	Occupational (Contextual) Math Concepts	Solutions
1. The company would like to increase sales by 15% next year, what would be the projected sales for the upcoming year?		
2. The company wants to decrease the percentage allocated for the cost of goods sold by 6%, what is the new cost of goods sold figure based on the current sales figure?		
3. If the sales figures for the company were $200,000 and all of the percentages remained the same, what are the new figures?		

Problems	Related, Generic Math Concepts	Solutions
4. If there are 2,825 teenagers enrolled in your school, about how many would you expect to be employed in retail?		
5. If approximately 25,000 teenagers work in the service industry, about how many working teenagers are there?		
6. If there are 2,825 teenagers enrolled in your school, about how many teenagers work in manufacturing or agriculture?		

Problems	PA Core Math Look	Solutions
7. The total amount of expenditures of the company is how many times that spent on taxes?		
8. If $250,000 is spent on advertising, then what is the difference in expenditure between taxes and transport?		
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Problems	Occupational (Contextual) Math Concepts	Solutions
1. The company would like to increase sales by 15% next year, what would be the projected sales for the upcoming year?	0.15 x 125,000 = $18,750 125,000 + 18,750 = $143,750	
2. The company wants to decrease the percentage allocated for the cost of goods sold by 6%, what is the new cost of goods sold figure based on the current sales figure?	40.0% - 6.0% = 34.0% .34 x 125,000 = $42,500	
3. If the sales figures for the company were $200,000 and all of the percentages remained the same, what are the new figures?	Projected Profit = 0.07 x $200,000 = $14,000 Rent and Utilities = 0.10 x $200,000 = $20,000 Advertising = 0.05 x $200,000 = $10,000 Insurance = 0.03 x $200,000 = $6,000 Salaries = 0.35 x $200,000 = $70,000 Cost of Goods Sold = 0.40 x $200,000 = $80,000	
Problems	**Related, Generic Math Concepts**	**Solutions**
4. If there are 2,825 teenagers enrolled in your school, how many would you expect to be employed in retail?	54% of 2,825 is the number employed in retail. 0.54(2,825) = x →1,525.5 or 1,526 students	
5. If approximately 25,000 teenagers work in the service industry, how many working teenagers are there?	25,000 is 25% of the number of working teenagers 25,000 = 0.25x →$\frac{25,000}{0.25} = \frac{0.25x}{0.25}$ x = 100,000 working teens	
6. If there are 2,825 teenagers enrolled in your school, how many teenagers work in manufacturing or agriculture?	Manufacturing = 5%, agriculture = 5% 10% of 2,825 is the number of teens who work in manufacturing or agriculture 0.10(2,825) = 282.5 or 283 students	
Problems	**PA Core Math Look**	**Solutions**
7. The total amount of expenditures of the company is how many times that spent on taxes?	Taxes =20%. 5 × 20% = 100% (total expenditures) Total expenditures are 5 times the amount of taxes.	
8. If $250,000 is spent on advertising, then what is the difference in expenditure between taxes and transport?	Advertising = 10% = $250,000 Taxes (20%) – Transport (15%) = 5% , which would be half of $250,000 $125,000 is the difference between taxes and transport.	
9. If $250,000 is spent on advertising, then what is the difference in expenditure between taxes and transport?	Loan interest = 5% = $275,000. Advertising = 10%, taxes = 20%, and R & D = 5% $550,000 + $1,100,000 + $275,000 = $1, 925,000 $1,9250,000	