Board Problems - Ch 14

Tell the nature of roots, then solve.

① $x^2 - 4x = -4$

② $2x^2 - 7x - 13 = -10$

③ $4x^2 + 8x + 7 = 0$

Ch 14 – Using Percents

Wholesale + markup = Retail price

Dinner + tax + tip = Total

Ex. 1

What percentage of Retail price did you save if you bought a $36 swimsuit For $27. Regular

Ex. 2

What percent of final cost is the markup of a basketball whose Wholesale Price is $25 and Retail Price is $35? 25

A variable can be identified further with another letter below it. This is called a subscript, "sub" meaning under, and "script" meaning write. So subscript is "written under". To represent cost we chose "C". To further distinguish "C" we added the subscript "o" for original and "f" for final.

Practice Problems

1) The wholesale price of the golf clubs is $254.00 and the retail price is $299.00. What percentage of the wholesale price is the profit, or markup?

2) The wholesale price of the golf clubs is $254.00 and the retail price is $299.00. What percentage of the retail price is the profit, or markup?

3) The final retail price was 22% above the original wholesale cost, which was $34.00. What is the final price?

4) The used car sold for $1,750.00. The car dealer made a profit of 12% of the original cost. What was the original cost?

Percentages are also used in computing sales tax and tips at a restaurant, as well as in chemistry and many other applications. The key is how you verbalize the problem and create the equation.

Example 4 I collected $142.08 in sales tax for the fourth quarter. Pennsylvania state sales tax is 6%. What were my gross sales during this quarter?

$$\text{Sales} \times 6\% = 142.08$$

$$\frac{.06}{.06}S = \frac{142.08}{.06}$$

$$S = 2{,}368.00$$

Example 5 The final bill at the restaurant was $35.09. This amount included a 15% tip and 6% sales tax. What was the cost of the food, the tip, and the tax? Round to the nearest cent.

$$C + 15\%C + 6\%C = 35.09$$

$$C + .15C + .06C = 35.09$$

$$C\frac{(1.21)}{1.21} = \frac{35.09}{1.21}$$

$$C = 29.00$$

Tax = 6% of 29.00

Tax = 1.74

Tip = 15% of 29.00

Tip = 4.35

Percentages for taxes and tip.

Ex. 4. I collected $142.08 in sales tax. If sales tax is 6%, what were my gross sales.

Ex. 5 - Final bill at a restaurant is $135.09. This amount included 15% tip and 10.1% tax.

Percent of Element in a Compound

Find the % of Hydrogen in water..

Find the Percent Carbon in Acetylene (C_2H_2)

Percentages of Elements in a Chemical Compound

A chemical compound is made up of elements. Each element has an atomic weight. When you add up the atomic weights for each of the elements in a compound, you get the molecular weight. The percentage of each element tells us how the mass or weight of the compound is distributed. Atomic weights for selected elements are given in a table below. Use this for future reference. The weights have been rounded to whole numbers for ease of use in the problems. For a complete guide to the elements consult a periodic table.

Symbol	Element	Atomic Weight
H	Hydrogen	1
Li	Lithium	7
Be	Beryllium	9
B	Boron	11
C	Carbon	12
N	Nitrogen	14
O	Oxygen	16
F	Fluorine	19
Na	Sodium	23
Mg	Magnesium	24
Si	Silicon	28
P	Phosphorus	31
S	Sulfur	32
Cl	Chlorine	35
K	Potassium	39
Ca	Calcium	40
Cr	Chromium	52
Fe	Iron	56

Example 1 Find the percentage of hydrogen in water.

H_2O is the chemical compound for water. This means there are 2 atoms of hydrogen and 1 atom of oxygen, H + H + O.*

The atomic weight of the whole compound is: 1 + 1 + 16 = 18

The weight of the hydrogen is 1 + 1 = 2.

The percentage of hydrogen is 2 of 18 or 2/18 = 1/9 = 11%.

The percentage of oxygen is 16 of 18 or 16/18 = 8/9 = 89%.

* In this compound the 2 tells how many hydrogen atoms, and is not a subscript.

Example 2 Find the percentage of carbon in C_2H_2.

C_2H_2 is the chemical compound. This means there are 2 atoms of carbon and 2 atoms of hydrogen, C+C+H+H.

The atomic weight of the whole compound is: 12+12+1+1 = 26

The weight of the hydrogen is 1+1 = 2.

The weight of the carbon is 12+12 = 24.

The percentage of carbon is 24 of 26 or 12/13 = 92%.

The percentage of hydrogen is 2 of 26 or 1/13 = 8%.

Practice Problems

1) Find the percentage of chlorine in NaCl.

2) Find the percentage of sodium in NaOH.

3) Find the percentage of nitrogen in KCN.

4) Find the percentage of potassium in KCN.

5) Find the percentage of oxygen in CO_2.

6) Find the percentage of carbon in CO_2.

LESSON PRACTICE

14A

Answer the questions.

1. The original price of the book was $45.00. Sarah bought it on sale for $33.75. What percent of the original price did she save?

2. The wholesale price of a shirt is $15.00 and the retail price is $25.00. What percent of the wholesale price is the markup or profit?

3. If the wholesale price of the shirt is $15.00 and the retail price is $25.00, what percent of the retail price is the profit?

4. The wholesale price of the chair was $32.00. The retail cost included a markup of 28%. What was the final cost of the chair?

5. The used car sold for $2,500. The dealer made a profit of 15% of the original cost. What was the original cost? (Round to the nearest dollar.)

6. In March, winter coats were advertised for 55% off the marked price. What would Naomi pay for a coat that was marked $195.00?

7. The state sales tax is 6%. Grace paid a total of $32.45 at the check-out. What was the amount of her purchase before taxes? (Round to the nearest cent.)

8. The price of the food at the restaurant came to $45.50. If the tax was 5.4% of that amount and the tip was 15%, what was the total amount spent? (Round to the nearest cent.)

For #9–12, use the atomic weight table in the instruction manual or on the symbols and tables page at the back of this book. Round to the nearest whole percent.

9. Find the percentage of silicon in SiO_2.

10. Find the percentage of oxygen in SiO_2.

11. Find the percentage of iron in Fe_2O_3.

12. Find the percentage of oxygen in Fe_2O_3.

LESSON PRACTICE 14B

Answer the questions.

1. The grocery store marked up all of its canned goods by 13%. What is the retail price of an item whose wholesale price is $.59?

2. Arthur earned $8,500 with his home business. Self-employment tax is 15.3%. How much tax must he pay?

3. The price of Tom's meal was $13.50, but the bill said $14.04. What percent was the meal tax?

4. The waitress gave Tom special assistance, so he gave a 20% tip. How much was his tip? (Figure the tip on the before-tax amount.)

5. The wholesale price of the paint is $9.50 and the retail price is $15.00. What percent of the retail price is the markup?

6. Forecasters predicted that the price of gasoline would rise by 12% over the summer. If the current price of a gallon is $1.38, what is the predicted price (to nearest cent)?