Definition:

• Percent: means "per hundred."

Percent Formulas:

• Sales tax amount

sales tax amount = tax rate \times item's cost.

• Discount amount

discount amount = discount rate \times original cost.

amount of increase

original amount

orginial amount

- Sale Price
- sale price = original price discount amount.

• Percentage increase percentage increase =

• Percentage decrease

 $extreme percentage decrease = \frac{\text{amount of decrease}}{\frac{1}{2}}$

Important Properties:

- To change a percent to a fraction: place the percentage over 100. For example $42\% = \frac{42}{100}$
- To change a percent to a decimal: move the decimal two places to the left. For example, 56% = .56
- To change a decimal to a percent: move the decimal two places to the right. For example, .32 = 32% and 1.13 = 113%.
- The word "of" indicates multiplication.
- Always change a percentage into a decimal before placing it in the mathematical equation.

PROBLEMS

1. 34 is what percent of 50?

Let x = the percentage

$$34 = 50x$$
$$\frac{34}{50} = x$$
$$.68 = x$$
$$34 \text{ is } 68\% \text{ of } 50$$

2. 32% of 94 is what?

Let x = the number

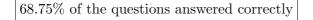
$$.32(94) = x$$

 $30.08 = x$
 $32\% \text{ of } 94 \text{ is } 30.08$

3. A mathematics test had 80 questions, each worth the same value. Wendy answered 55 of the questions correctly. What percent of the questions did she answer correctly?

> Let x = the percentage of questions answered correctly.

> > 55 = 80x $\frac{55}{80} = x$.6875 = x



4. A basketball team wins 105 games, which is 70% of the games played. How many games were played?

Let
$$x =$$
 the total number of games played.

.70x = 105 $x = \frac{105}{.70}$ x = 150

There were 150 total games.

5. If a dress that originally sold for \$35 is on sale for \$28, what is the discount rate?

Let x = discount rate of the dress.

percentage discount =
$$\frac{\text{amount of decrease}}{\text{orginial amount}}$$

 $x = \frac{35 - 28}{35}$
 $x = \frac{7}{35}$
 $x = .2$

The dress is discounted 20%

6. A house that sells for \$94,000 requires a 20% down payment. What is the amount of the down payment?

Let x = amount of the down payment.

x = .20(94,000)x = 18,800\$18,800 is the required down payment

7. If a suit originally priced at \$452 is offered on sale for 35% off, find the sale price of the suit.

Let x = sale price of the suit.

sale price = original price - discount amount x = 452 - .35(452) x = 452 - 158.20 x = 293.80The sale price of the suit is \$293.80

8. If a dress is on sale for \$36.80 and this is 25% off the original price, find the original price of the dress.

Let x = the original price of the dress.

sale price = original price – discount amount 36.80 = x - .20x 36.80 = .80x $\frac{36.80}{.80} = x$ 46 = x

The original price of the dress is \$46

9. A round-trip ticket costs \$340 without tax. If the tax rate is $5\frac{1}{2}$ %, what is the total cost of the ticket?

Let x = the total cost of the ticket.

NOTE: $5\frac{1}{2}\% = 5.5\% = .055$.

total cost = cost of ticket + sales tax

$$x = 345 + .055(340)$$

$$x = 345 + 18.7$$

$$x = 363.7$$

The total cost is \$363.70

Let x = the price the bench should be marked.

Profit Jim wants to make = .20(330) =\$66.

Price willing to sell the bench: \$330 + \$66 = \$396.

NOTE: \$396 is the price after Jim offers a 10% discount.

396 = x - .10x396 = .90x440 = x

Jim should mark the bench at 440

11. If income tax is \$3,502 plus 28% of taxable income over \$28,000, how much is the income tax on a taxable income of \$35,000?

Let x = income tax on \$35,000.

x = 3502 + .28(35,000 - 28,000) x = 3502 + .28(7,000) x = 3502 + 1960x = 5462

Income tax is \$5,462.

12. In 1999, the number of households on-line was 56.7 million. In 2000, the number jumped to 66.6 million. What is the percentage increase of on-line households from 1999 to 2000?

Let x = percentage increase of on-line households.

percentage increase =	amount of increase
	original amount
x =	66.6 - 56.7
	56.7
x =	$\frac{9.9}{56.7}$
<i>w</i> —	56.7
x =	.1746301

17.46% increase of on-line households.