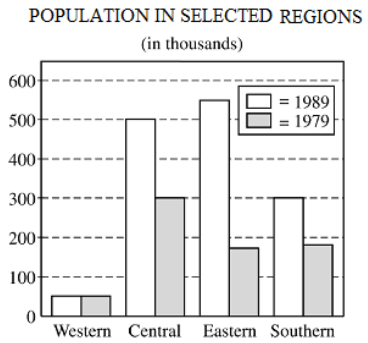
## PROBLEMS

**Problem 1.** A box contains 3,900 solid-colored marbles that are either orange, blue, red, or green. If 19 percent of the marbles are orange, 29 percent of the marbles are red, and 39 percent of the marbles are blue, what percent are green?
(A) 13% (B) 23% (C) 33% (D) 58% (E) 87%

**Problem 2.** From 1979 to 1989, the total population in the four regions of ABC city increased by approximately what percent?
(A) 50% (B) 90% (C) 95% (D) 100% (E) 150%




**Problem 3.** If 0.05 percent of $n$ is 5, what is 5 percent of $n$ ?
(A) 900 (B) 600 (C) 500 (D) 0.006 (E) 0.003

**Problem 4.** Sixty percent of the songs played on a certain radio station are 5 minutes long, 30 percent are 8 minutes long, and 10 percent are 6 minutes long. What is the average (arithmetic mean) number of minutes per song played on this radio station?

**Problem 5.** If the length of a rectangle is increased by 40% and the width of the same rectangle is decreased by 40%, what is the effect on the area of the rectangle?

(A) It is increased by 60%. (B) It is increased by 30%. (C) It is unchanged.
(D) It is decreased by 15%. (E) It is decreased by 9%.

**Problem 6.** Rita's dog weighed 10 pounds when she bought it. Over the next several years, the dog's weight increased by 11 percent per year. Which of the following functions gives the weight, $w$, in pounds, of the dog after $n$ years of weight gain at this rate?

(A) $w(n) = 10 + 0.11^n$ (B) $w(n) = 10(0.11)^n$ (C) $w(n) = 10(0.9)^n$

(D) $w(n) = 10(1.11)^n$ (E) $w(n) = 10(n)^{1.11}$

**Problem 7.** Find $4\frac{1}{2}\%$ of 500. Express your answer as a decimal.

**Problem 8.** What percent of 500 is 200?

**Problem 9.** Sixty-four is 25% of what number?

**Problem 10.** 6000 is $1\frac{1}{2}\%$ of what number?

**Problem 11.** On an achievement test, ninth graders averaged 93% and eighth graders averaged 75%. A total of 90 students took the test and averaged 87%. How many ninth graders took the test?

**Problem 12.** A basketball team has played 12 games and won 10 of them. If the team wins $44\frac{4}{9}\%$ of its remaining 18 games, what percent of its games has the team won at the end of the season?

**Problem 13.** During a sale, all items were marked 40% off. If the sale price of an item was \$10.50, what was its original price in dollars?

**Problem 14.** The price of an article was marked down 35% during a sale. If the sale price was \$36.40, what was the price before the sale?

**Problem 15.** A refrigerator is offered for sale at \$250.00 less successive discounts of 20% and 15%. The sale price of the refrigerator is:

(A) 35% less than \$250.00 (B) 65% of \$250.00 (C) 77% of \$250.00
(D) 68% of \$250.00 (E) none of these

**Problem 16.** An item was placed on sale in January for 30% less than its original price. A final close-out sale was offered in February, and the January sale price was reduced by 40%. What percent of the original price was the final reduced price?

**Problem 17.** An item was placed on sale in January for 30% less than its original price. A final close-out sale was offered in February, and the January sale price was reduced by 40%. What percent of the original price was the final reduced price?

**Problem 18.** How many dollars would be paid in simple interest if \$200 is borrowed at 12% per year for 5 months?

**Problem 19.** Two high school classes took the same test. One class of 20 students made an average grade of 80%; the other class of 30 students made and average grade of 70% . The average grade for all students in both classes is:
(A) 75% (B) 74% (C) 72% (D) 77% (E) none of these

**Problem 20.** A house and store were sold for \$12,000 each. The house was sold at a loss of 20% of the cost, and the store at a gain of 20% of the cost. The entire transaction resulted in :
(A) no loss or gain (B) loss of \$1000 (C) gain of \$1000
(D) gain of \$2000 (E) none of these

**Problem 21.** A housewife saved \$2.50 in buying a dress on sale. If she spent \$25 for the dress, she saved about:
(A) 8% (B) 9% (C) 10% (D) 11% (E) 12%

**Problem 22.** How much water should be added to 8 liters of 90% alcohol to make a 40% alcohol solution?

**Problem 23.** How many liters of water should be added to 10 liter of a 20% saline (salt) solution to make a 5% saline solution?

**Problem 24.** How many grams of 5% salt solution should be added to 500 grams of a 20% salt solution to make a 15% salt solution?

**Problem 25.** A 30% alcohol solution is added *x* grams pure water to make a 24% alcohol solution. If *x* gram pure water is added again to the solution, what was the percentage of the resulting solution?
(A) 30% (B) 20% (C) 10% (D) 8% (E) 5%

**Problem 26.** A sort of coals weighed 100 kg contained 14.5% water. After some time evaporating, the water was 10%. What was the ratio of the weight of the coals now to the weight of coals before evaporation?
(A) 19/20 (B) 20/19 (C) 9/10 (D) 8/10 (E) 171/180

**Problem 27.** A box of staples contains 4,600 staples that are either silver, black, or red. If 46 percent of the staples are silver and 46 percent are black, how many red staples are there?
(A) 2116 (B) 2484 (C) 368 (D) 828 (E) 920

**Problem 28.** Alex and Betsy are both salespeople. Alex's weekly compensation consists of $800 plus 30 percent of his sales. Betsy's weekly compensation consists of $600 plus 35 percent of her sales. If they both had the same amount of sales and the same compensation for a particular week, what was that compensation, in dollars? (Disregard the dollar sign when recording your answer).

**Problem 29.** Twenty-four is $8\frac{1}{3}\%$ of what number?

**Problem 30.** Find $12\frac{1}{2}\%$ of 160.

**Problem 31.** If $q$ and $r$ are positive numbers, what percent of $(q + r)$ is $r$ ?
(A) $\frac{1}{100r(q+r)}\%$ (B) $\frac{q+r}{100r}\%$ (C) $\frac{100(q+r)}{r}\%$ (D) $(\frac{100r}{q}+r)\%$ (E) $\frac{100r}{q+r}\%$

**Problem 32.** On a $10,000 order a merchant has a choice between three successive discounts of 20%, 20%, and 10% and three successive discounts of 40%, 5%, and 5%. By choosing the better offer, he can save:
(A) nothing at all (B) $400 (C) $330 (D) $345 (E) $360

**Problem 33.** Ann borrowed $750.00 at a simple interest rate of 7.5% per year. How much will Ann owe after eight months?
(A) 37.50 (B) 795.50 (C) 56.25 (D) 787.50 (E) 800.00

**Problem 34.** A pharmacist wants to dilute a 10% hydrogen peroxide solution to 3%. How much distilled water must he add to make 10 liters of 3% solution?
(A) 5 (B) 7 (C) 8 (D) 10 (E) 2