Name: _____

1. PERCENT OF INCREASE OR DECREASE

The percent of increase or decrease is found by putting the amount of increase or decrease over the original amount and changing this fraction to a percent by multiplying by 100.

Example:

> The number of automobiles sold by the Cadcoln Dealership increased from 300 one year to 400 the following year. What was the percent of increase?

Solution:

> There was an increase of 100, which must be compared to the original 300.
>
> $$\frac{100}{300} = \frac{1}{3} = 33\frac{1}{3}\%$$

Example:

> The Sunset School dismisses 20% of its staff of 150 due to budgetary problems. By what percent must it now increase its staff to return to the previous level?

Solution:

> $$20\% = \frac{1}{5} \qquad \frac{1}{5} \cdot 150 = 30$$
>
> The school now has 150 – 30 or 120 employees. To increase by 30, the percent of increase is
> $$\frac{30}{120} = \frac{1}{4} = 25\%.$$

Exercise 1

Work out each problem. Circle the letter that appears before your answer.

1. Mrs. Morris receives a salary raise from $25,000 to $27,500. Find the percent of increase.
   - (A) 9
   - (B) 10
   - (C) 90
   - (D) 15
   - (E) 25

2. The population of Stormville has increased from 80,000 to 100,000 in the last twenty years. Find the percent of increase.
   - (A) 20
   - (B) 25
   - (C) 80
   - (D) 60
   - (E) 10

3. The value of Super Company Stock dropped from $25 a share to $21 a share. Find the percent of decrease.
   - (A) 4
   - (B) 8
   - (C) 12
   - (D) 16
   - (E) 20

4. The Rubins bought their home for $30,000 and sold it for $60,000. What was the percent of increase?
   - (A) 100
   - (B) 50
   - (C) 200
   - (D) 300
   - (E) 150

5. During the pre-holiday rush, Martin's Department Store increased its sales staff from 150 to 200 persons. By what percent must it now decrease its sales staff to return to the usual number of salespersons?
   - (A) 25
   - (B) $33\frac{1}{3}$
   - (C) 20
   - (D) 40
   - (E) 75

2. DISCOUNT

A discount is usually expressed as a percent of the marked price, which will be deducted from the marked price to determine the sale price. If an article is sold at a 20% discount, the buyer pays 80% of the marked price. Instead of first finding the amount of discount by finding 20% of the marked price and subtracting to find the sale price, it is shorter and easier to find 80% of the marked price directly.

Example:

A store offers a 25% discount on all appliances for paying cash. How much will a microwave oven marked at $400 cost if payment is made in cash?

Solution:

We can find 25% or $\frac{1}{4}$ of $400, which is $100, then subtract $100 from $400 to get a cash price of $300. The danger in this method is that the amount of discount, $100, is sure to be among the multiple-choice answers, as students often look for the first answer they get without bothering to finish the problem. It is safer, and easier, to realize that a 25% discount means 75% must be paid. 75% = $\frac{3}{4}$ and $\frac{3}{4}$ of $400 is $300.

Some problems deal with successive discounts. In such cases, the first discount is figured on the marked price, while the second discount is figured on the intermediate price.

Example:

Johnson's Hardware Store is having a moving sale in which everything in the store is being marked down 20% with an additional 5% discount for paying cash. What will be the net cost of a toaster, paid with cash, marked at $25?

Solution:

The first discount is 20% or $\frac{1}{5}$. We then pay $\frac{4}{5}$ of $25 or $20. An additional 5% is given off this amount. $\frac{5}{100} = \frac{1}{20}$ off. $\frac{19}{20} \cdot 20 = \$19$. The net price is $19.

Exercise 2

Work out each problem. Circle the letter that appears before your answer.

1. How much is saved by buying a freezer marked at $600 with a discount of 20% rather than one marked at $600 with a discount of 10% then 10%?
   - (A) $6
   - (B) $8
   - (C) $10
   - (D) $12
   - (E) $20

2. Mr. Kaplan builds a home at a cost of $60,000. After pricing the home for sale by adding 25% of his expenses, he offers a discount of 20% to encourage sales. What did he make on the house?
   - (A) $15,000
   - (B) $1500
   - (C) $0
   - (D) $5000
   - (E) $1200

3. Christmas cards are sold after Christmas for 90 cents a box instead of $1.20 a box. The rate of discount is
   - (A) 20%
   - (B) 25%
   - (C) 30%
   - (D) $33\frac{1}{3}$%
   - (E) 40%

4. A television set listed at $160 is offered at a $12\frac{1}{2}$ % discount during a storewide sale. If an additional 3% is allowed on the net price for payment in cash, how much can Josh save by buying this set during the sale for cash?
   - (A) $24.36
   - (B) $24.80
   - (C) $17.20
   - (D) $24.20
   - (E) $23.20

5. Pam pays $6 for a sweater after receiving a discount of 25%. What was the marked price of the sweater?
   - (A) $9
   - (B) $12
   - (C) $7
   - (D) $7.50
   - (E) $8

3. COMMISSION

In order to inspire sales, many companies pay their salespeople a percentage of the money the salespeople bring in. This is called a commission.

Example:

Mr. Silver sells shoes at the Emporium, where he is paid $100 per week plus a 5% commission on all his sales. How much does he earn in a week in which his sales amount to $1840?

Solution:

Find 5% of $1840 and add this amount to $100.

$$\begin{array}{r} 1840 \\ \times\,.05 \\ \hline \$92.00 \end{array} \quad + \$100 = \$192$$

Example:

Audrey sells telephone order merchandise for a cosmetics company. She keeps 12% of all money collected. One month she was able to keep $108. How much did she forward to the cosmetics company?

Solution:

We must first find the total amount of her sales by asking: 108 is 12% of what number?

$108 = .12x$

$10800 = 12x$

$900 = x$

If Audrey collected $900 and kept $108, she sent the company $792.

Exercise 3

Work out each problem. Circle the letter that appears before your answer.

1. Janice receives a 6% commission for selling newspaper advertisements. If she sells 15 ads for $50 each, how much does she earn?

   (A) $30
   (B) $40
   (C) $45
   (D) $18
   (E) $450

2. Michael sells appliances and receives a salary of $125 per week plus a 5% commission on all sales over $750. How much does he earn in a week in which his sales amount to $2130?

   (A) $69
   (B) $294
   (C) $106.50
   (D) $194
   (E) $162.50

3. Mr. Rosen receives a salary of $100 per month plus a commission of 3% of his sales. What was the amount of his sales in a month in which he earned a total salary of $802?

   (A) $23,500
   (B) $23,400
   (C) $7800
   (D) $7900
   (E) $7700

4. Bobby sent $27 to the newspaper dealer for whom he delivers papers, after deducting his 10% commission. How many papers did he deliver if they sell for 20 cents each?

   (A) 150
   (B) 135
   (C) 600
   (D) 160
   (E) 540

5. Mrs. Mitherz wishes to sell her home. She must pay the real estate agent who makes the sale 8% of the selling price. At what price must she sell her home if she wishes to net $73,600?

   (A) $79,488
   (B) $75,000
   (C) $80,000
   (D) $82,400
   (E) $84,322

4. PROFIT AND LOSS

When a merchant purchases an item, he adds a percent of this cost to what he paid to arrive at a selling price. This amount is called his profit.

Example:

A radio sells for $40, giving the dealer a 25% profit. What was his cost?

Solution:

If the dealer gets back all of his cost plus an extra 25%, then the $40 sales price represents 125% of his cost.

$1.25x = 40$

$125x = 4000$

$x = \$32$

Example:

Joan's Boutique usually sells a handbag for $80, which yields a $33\frac{1}{3}$% profit. During a special sale, the profit is cut to 10%. What is the sale price of the handbag?

Solution:

$80 represents $133\frac{1}{3}$% of the cost.

$\frac{4}{3}x = 80$

$4x = 240$

$x = 60$

If the cost was $60 and the dealer wishes to add 10% for profit, he must add 10% of $60 or $6, making the sale price $66.

If a merchant sells an article for less than his cost, he takes a loss. A loss is figured as a percent of his cost in the same manner we figured a profit in the previous examples.

Exercise 4

Work out each problem. Circle the letter that appears before your answer.

1. Steve buys a ticket to the opera. At the last moment, he finds he cannot go and sells the ticket to Judy for $10, which was a loss of $16\frac{2}{3}$ %. What was the original price of the ticket?

   (A) $8.33
   (B) $16.66
   (C) $12
   (D) $11.66
   (E) $15

2. Alice bought a bicycle for $120. After using it for only a short time, she sold it to a bike store at a 20% loss. How much money did the bike store give Alice?

   (A) $24
   (B) $96
   (C) $144
   (D) $100
   (E) $108

3. Julie's Dress Shop sold a gown for $150, thereby making a 25% profit. What was the cost of the gown to the dress shop?

   (A) $120
   (B) $112.50
   (C) $117.50
   (D) $187.50
   (E) $125

4. If a music store sells a clarinet at a profit of 20% based on the selling price, what percent is made on the cost?

   (A) 20
   (B) 40
   (C) 25
   (D) 80
   (E) none of these

5. Radio House paid $60 for a tape player. At what price should it be offered for sale if the store offers customers a 10% discount but still wants to make a profit of 20% of the cost?

   (A) $64.80
   (B) $72
   (C) $79.20
   (D) $80
   (E) $84.20

5. TAXES

Taxes are a percent of money spent, money earned, or value.

Example:

Broome County has a 4% sales tax on appliances. How much will Mrs. Steinberg have to pay for a new dryer marked at $240?

Solution:

Find 4% of $240 to figure the tax and add this amount to $240. This can be done in one step by finding 104% of $240.

$$\begin{array}{r} 240 \\ \times 1.04 \\ \hline 960 \\ 24000 \\ \hline \$249.60 \end{array}$$

Example:

The Social Security tax is $7\frac{1}{4}$%. How much must Mrs. Grossman pay in a year if her salary is $2000 per month?

Solution:

Her annual salary is 12(2000) or $24,000. Find $7\frac{1}{4}$% of $24,000.

$$\begin{array}{r} 24,000 \\ \times .0725 \\ \hline 12\ 0000 \\ 48\ 0000 \\ 1680\ 0000 \\ \hline \$1740.0000 \end{array}$$

Exercise 5

Work out each problem. Circle the letter that appears before your answer.

1. In Manorville, the current rate for school taxes is 7.5% of property value. Find the tax on a house assessed at $20,000.
    - (A) $150
    - (B) $1500
    - (C) $15,000
    - (D) $1250
    - (E) $105

2. The income tax in a certain state is figured at 2% of the first $1000, 3% of the next $2000, 4% of the next $3000, and 5% thereafter. Find the tax on an income of $25,000.
    - (A) $1150
    - (B) $1015
    - (C) $295
    - (D) $280
    - (E) $187

3. The sales tax in Nassau County is 7%. If Mrs. Gutman paid a total of $53.50 for new curtains, what was the marked price of the curtains?
    - (A) $49.75
    - (B) $49
    - (C) $57.25
    - (D) $50
    - (E) $45.86

4. Eric pays r% tax on an article marked at s dollars. How many dollars tax does he pay?
    - (A) $\dfrac{s}{100r}$
    - (B) rs
    - (C) $\dfrac{100s}{r}$
    - (D) $100rs$
    - (E) $\dfrac{rs}{100}$

5. The sales tax on luxury items is 8%. If Mrs. Behr purchases a mink coat marked at $4000, what will be the total price for the coat, including tax?
    - (A) $320
    - (B) $4032
    - (C) $4320
    - (D) $4500
    - (E) $500