**Percentages**

The term percent means for every hundred. A fraction whose denominator is 100 called a percentage and the numerator of the fraction is called the rate percent. It is denoted as symbol %

**Important Applications**

1. To find % equivalent of a fraction or decimal, multiply that fraction/decimal to 100.

Ex. 2/5 = (2/5)\*100 = 40%

2. To increase a number by a given rate (%), multiply the number to (100+ rate)/100

Ex. Increase 40 by 30%

= 40X (100+30)/100 = 40X130/100 = 52

3. To decrease a number by a given rate (%), multiply the number to (100- rate)/100

Ex. Decrease 40 by 30%

= 40X (100-30)/100 = 40X70/100 = 28

4. % increase of a number = (Total Increase/ Initial Value) X 100

Ex. Price of Car has been increased from 400,000 to 500,000, find the % increase.

= [(500,000-400,000)/400,000] X 100 = (100,000/400,000)X100 = 25%

5. % decrease of a number = (Total Decrease/ Initial Value) X 100

Ex. Price of Dell Laptop has Fallen from 25,000 to 20,000, find the % decrease.

= [(25,000-20,000)/25,000] X 100 = (5,000/25,000)X100 = 20%

6. If the present value of a machine is P and it depreciates by r% anually, the value of machine after n years is

= P\*[(1-(R/100))^n]

7. If A's income is r% more than of B, then B's income is less than of A by [(r/(100+r))\*100]%

8. If A's income is r% less than of B, then B's income is more than of A by [(r/(100-r))\*100]%

9. If the price of a commodity increase by r% then reduction in consumption, so as not to increase the expenditure is [(r/(100+r))\*100]%

10. If the price of a commodity decrease by r% then increasae in consumption, so as not to decrease the expenditure is [(r/(100-r))\*100]%

Example:

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| Example 1 | A test has 20 questions. If peter gets 80% correct, how many questions did peter missed? |
| Solution | The number of correct answers is 80% of 20 or 80/100 × 20  80/100 × 20 = 0.80 × 20 = 16  Recall that 16 is called the percentage. It is the answer you get when you take the percent of a number  Since the test has 20 questions and he got 16 correct answers, the number of questions he missed is 20 − 16 = 4  Peter missed 4 questions |

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| Example 2 | 24 students in a class took an algebra test. If 18 students passed the test, what percent do not pass? |
| Solution | First, find out how many student did not pass.  Number of students who did not pass is 24 − 18 = 6  Then, write down the following equation:  x% of 24 = 6 or x% times 24 = 6  To get x%, just divide 6 by 24  6/24 = 0.25 = 25/100 = 25%  Therefore, 25% of students did not pass  If you really understand the percentage word problems above, you can solve any other similar percentage word problems. |