MATHEMATICAL APPLICATIONS 1

WEEK 2 NOTES & EXERCISES

COMPARING TWO QUANTITIES

One quantity may be expressed as a percentage of another quantity or number (both quantities must be in the same units).

To find the percentage something is of a whole, take $\frac{\text{what you want}}{\text{the total there is}} \times 100$.

EXAMPLE

What percent is 482 of 1780 $\frac{\text{what you want}}{\text{the total there is}} \times 100$

$$\frac{482}{1780} \times 100 = 27.08\%$$

QUESTION 1

1. What percentage of 65 is 13?

2. If 12 out of 21 students in a class are girls, then, to the nearest percent, what percent of the class is composed of girls?

3. In a laboratory test on 360 light globes, 16 globes were found to be defective. What percentage were satisfactory (to one decimal place)?

4. After three rounds of a basketball competition, a basketball team had scored 300 points and had 360 points scored against them. Express the points scored by the team as a percentage of the points scored against them.

5. In a population of $3\frac{1}{4}$ million people, 2115000 are under the age of 16. Calculate the percentage, to two decimal places, of the population who are under the age of 16.

PERCENTAGE INCREASE AND DECREASE

When increasing or decreasing a quantity by a given percentage, the percentage increase or decrease is always calculated as a percentage of the original amount.

Example: Sally's daily wage of \$175 is increased by 15%. Calculate her new weekly wage.

15% 0f 175 $= \frac{15}{100} \times 175$

$= 26.25$

Sally's new salary = 175 + 26.26

= \$201.25

Another method: 100% + 15% = 115%

115% of \$175 $= \frac{115}{100} \times 175$

= \$201.25

QUESTION 2

1. Increase $700 by 25%

2. Decrease 340 km by 18%

3. A restaurant adds a 12% surcharge to bills on public holidays. Calculate the total to be paid if the bill for a dinner for two on Australia Day comes to $74.50

4. A large workshop normally services an average of 240 cars in a week. Due to an outbreak of the flu there is a 35% reduction in the number of cars serviced in a particular week. How many cars were serviced in that week?

5. Due to the closure of a large business in the area, a school is expecting an 11% drop in its student numbers for the next year. If the current enrolment is 684 students, what is the anticipated enrolment for the next year?

FINDING THE WHOLE FROM A GIVEN PERCENTAGE

If a percentage of an amount is known, then the whole amount can be found by using the unitary method. This involves dividing to find 1% then multiplying by 100 to find 100%

Example: If 15% of an unknown number is $9, find the whole amount

1% is 9 divided by 15 = $0.6 (or 60 cents)

The whole (100%) = 0.6 × 100

= $60 ie $9 is 15% of $60

Example: A TV discounted by 20% now sells for $2100. What was the original price?

A 20% discount means that that $2100 is 80% of the original price. The original price is 100% and 20% off leaves 80%.

1% is 2150 divided by 80 = 26.25

The whole (100%) = 26.25 × 100 = $2625

QUESTION 3

1. Find the whole amount if 75% is 150 km.

2. 245 students at a school voted for a new uniform. If this is 35% of the school population, what is the school population?

3. The cost of a holiday is discounted by 25%. The holiday now costs $4800. What was the original cost of the holiday?

4. The profit on an iPod is 65% of the cost price. If the profit is $106, find the cost price correct to the nearest dollar