# Learning Plan 3

## Chapter 3

### Questions 1 and 2
(page 82)

To convert a decimal into a percent, you must move the decimal point <u>two places</u> to the <u>right</u>.

For example:
$$0.72 = 72\%$$

$$5.46 = 546\%$$

$$3.0842 = 308.42\%$$

### Question 3

Write the fraction as a decimal.
$$\frac{2}{5}$$

<u>Solution</u>

Use the calculator: $2 \div 5 = 0.4$

### Question 4
(page 84)

To convert a percent to a decimal, you must move the decimal point <u>two places</u> to the <u>left</u>.

For example:
$$25\% = 0.25$$

$$1.3\% = 0.013$$

$$270\% = 2.7$$

## Question 5
(pages 82-84)

Complete the table:

| Fraction | Decimal | Percent |
|---|---|---|
| $\dfrac{1}{20}$ | | |

Solution:

| Fraction | Decimal | Percent |
|---|---|---|
| $\dfrac{1}{20}$ | Use the calculator: $1 \div 20 = 0.05$ | We must move the decimal point two places to the right: $0.05 = 5\%$ <br><br> So, the percent is: 5% |

## Question 6
(pages 82-84)

Complete the table:

| Fraction | Decimal | Percent |
|---|---|---|
| | 0.024 | |

Solution:

| Fraction | Decimal | Percent |
|---|---|---|
| *(if you have 3 digits after the decimal point, you will write 1000 in the denominator)* $$0.024 = \frac{24}{1000}$$ $$= \frac{24 \div 8}{1000 \div 8} = \frac{3}{125}$$ So, the fraction is: $$\frac{3}{125}$$ | 0.024 | We have to move the decimal point two places to the right: <br><br> $0.024 = 2.4\%$ <br><br> So, the percent is: <br><br> 2.4% |

## Question 7
(pages 82-84)

Complete the table:

| Fraction | Decimal | Percent |
|---|---|---|
|  | 4.5 |  |

Solution:

| Fraction | Decimal | Percent |
|---|---|---|
| $4.5 = 4\dfrac{5}{10}$<br><br>$= 4\dfrac{5 \div 5}{10 \div 5}$<br><br>$= 4\dfrac{1}{2}$<br><br>$= \dfrac{4 \cdot 2 + 1}{2}$<br><br>$= \dfrac{9}{2}$<br><br><br>So the fraction is:<br><br>$\dfrac{9}{2}$ | 4.5 | We have to move the decimal point two places to the right:<br><br>$4.5 = 450\%$<br><br>So, the percent is:<br><br>450% |

## Questions 9 and 10

On page 89 in the textbook you have an important formula:

$$\color{red}{P = R \times P}$$

$$\color{red}{\textbf{Part} = \textbf{Rate} \times \textbf{Base}}$$

Example: You want to find out what is 30% out of $200.
According to the formula, you must multiply the Percent by the Base, to get the Part (and remember, percent has to be in decimal form):

$$Part = 0.3 \cdot \$200$$

$$Part = \color{red}{\$60}$$

*When you have a problem, how do you know what number in the base, what number is the rate, and what number is the part?*

| Base | Rate | Part |
|------|------|------|
| Base represents the total, starting point, the original quantity, and many times has the word "of" in front of the number. | Rate will have the % percent symbol next to the number. | Part is the amount of the total, and many times you will see the word "is" or "equals" in front of the number. |
| For example: | For example: | For example: |
| 30% *of* $200. | 30% | 30% of $200 is $60 |
| So, $200 is the base. | | So, $60 is the part. |

## Question 11 and 12
(page 96)

To find the base, you have to divide the part by the rate. See the formula on page 96:

$$\text{Base} = \frac{\text{Part}}{\text{Rate}}$$

## Example:

70 is 35% of what number?

## Solution

*Make sure to convert percent into a decimal:* $35\% = 0.35$

$$\text{Base} = \frac{\text{Part}}{\text{Rate}}$$

$$= \frac{70}{0.35}$$

$$= 200$$

## Question 13
(p. 102-103)

To find the rate, you have to divide the part by the base. See the formula on page 102:

$$\text{Rate} = \frac{\text{Part}}{\text{Base}}$$

## Example:
What % of 96 is 24?

## Solution

$$\text{Rate} = \frac{\text{Part}}{\text{Base}}$$

$$= \frac{24}{96}$$

$$= 0.25$$

*Make sure to convert the decimal into percent.*

$$= 25\%$$

## Question 14
(p. 102-103)

To find the rate, you have to divide the part by the base. See the formula on page 102:

$$\text{Rate} = \frac{\text{Part}}{\text{Base}}$$

## Example:
80 phones is what percent of 20 phones?

## Solution

*Notice that in this problem the part is larger than the base. This will give you an answer more than 100%.*

$$\text{Rate} = \frac{\text{Part}}{\text{Base}} = \frac{80}{20} = 4$$

*Make sure to convert the decimal into percent.*

$$= 400\%$$

## Questions 15 and 17
(p. 110-113)

The part after increase is $32.5.
The rate of increase is 30%.
Find the base.

## Solution

The problem says that you had a certain amount of dollars in the beginning, but after this amount was increased by 30%, now you have $32.5.

So, in the beginning your amount represented 100%. But once it increased by 30%, the new amount (after increase) represents:

$$100\% + 30\% = 130\% = 1.3$$

To find the base:

$$\text{Base} = \frac{\text{Part}}{\text{Rate}}$$

$$= \frac{32.5}{1.3}$$

$$= \$25$$

## Question 16
(p. 110-113)

The part after decrease is $15,000.
The rate of decrease is 20%.
Find the base.

### Solution

The problem says that you had a certain amount of dollars in the beginning, but after this amount was decreased by 20%, now you have $15,000.

So, in the beginning your amount represented 100%. But once it decreased by 20%, the new amount (after decrease) represents:

$$100\% - 20\% = 80\% = 0.8$$

To find the base:

$$\text{Base} = \frac{\text{Part}}{\text{Rate}}$$

$$= \frac{15,000}{0.8}$$

$$= \$18,750$$

## Question 18

In 2001, the population in a town was 11% more than it was in 2000. If the population was 21,690 in 2002, which was 10% more than 2001, find the population in 2000.

### Solution

$$100\% + 10\% = 110\% = 1.1$$

The population in 2001:

$$\text{Base} = \frac{\text{Part}}{\text{Rate}} = \frac{21,690}{1.1} = 19718.1818\ldots$$

$$100\% + 11\% = 111\% = 1.11$$

The population in 2000:

$$\text{Base} = \frac{\text{Part}}{\text{Rate}} = \frac{19718.1818}{1.11} \approx 17,764$$

*(rounded to the nearest whole number)*

## Question 19

Complete the table.

Round dollar amounts to the nearest cent and percentages to the nearest tenth.

| Company | Stock price last year | Stock price this year | % Change from Last Year |
|---|---|---|---|
| A | $362.45 | $587.41 | |
| B | $78.32 | | 6.8% |
| C | | $89.60 | 8.0% |
| D | $65.82 | | 14.5% |
| | **BASE** | **PART AFTER INCREASE** | **RATE of INCREASE** |

Solution

A.

$$\text{Rate} = \frac{\text{Part}}{\text{Base}} = \frac{587.41}{362.45} \approx 1.62066 \approx 162.1\%$$

So, if the stock last year represented 100%, and this year represents 162.1%, the percent change from last year is **62.1**%. *(because $162.1\% - 100\% = 62.1\$$)*

B.

$$100\% + 6.8\% = 106.8\% = 1.068$$
$$Part = Rate \times Base$$
$$= 1.068 \times 78.32$$
$$= 83.64576$$
$$\approx \mathbf{83.65}$$

C.

$$100\% + 8\% = 108\% = 1.08$$

$$\text{Base} = \frac{\text{Part}}{\text{Rate}}$$

$$= \frac{89.60}{1.08}$$

$$\approx 82.96296$$
$$\approx \mathbf{82.96}$$

D.

$$100\% + 14.5\% = 114.5\% = 1.145$$
$$Part = Rate \times Base$$
$$= 1.145 \times 65.82$$
$$= 75.3639$$
$$\approx \mathbf{75.36}$$