

Quick Review

## 1. Adding fractions

Calculate:  $3\frac{1}{5} + 3$ 

$$= \frac{16}{5} + \frac{3}{1} = \frac{16+15}{5 \times 1} = \frac{31}{5}$$

$$= 6\frac{1}{5}$$

## 2. Subtracting Fractions

Calculate:  $\frac{3}{15} - \frac{2}{20}$ 

$$= \frac{3 \times 20}{15 \times 20} - \frac{2 \times 15}{20 \times 15} = \frac{60}{300} - \frac{30}{300} = \frac{60-30}{300} = \frac{30}{300} \cancel{10}$$

$$= \frac{1}{10}$$

## 3. Multiplying Fractions

Calculate:  $\frac{11}{9} \times \frac{18}{44}$ 

$$= \frac{11}{9} \times \frac{9 \times 2}{11 \times 4} = \frac{2}{4} = \frac{1}{2}$$

## 4. Dividing Fractions

Calculate:  $2 \div 2\frac{1}{8}$ 

$$= \frac{2}{1} \div \frac{17}{8}$$

$$= \frac{2}{1} \times \frac{8}{17} = \frac{16}{17}$$

5. Decimals  $\rightarrow$  Fractions

Express 0.555 as a fraction

$$0.555 = \frac{555}{1000} = \frac{111}{200}$$

Express  $\frac{3}{7}$  as a decimal to the nearest thousandths

$$\frac{3}{7} = 3 \div 7 = 0.\underline{4285}714286$$

$$= 0.429$$

$$\frac{3}{7} = 3 \div 7 = 0.\underline{428571}4286$$

$$= 0.42\dot{8}$$

0.428467 → 0.4285 → 0.429 (WRONG)  
= 0.428

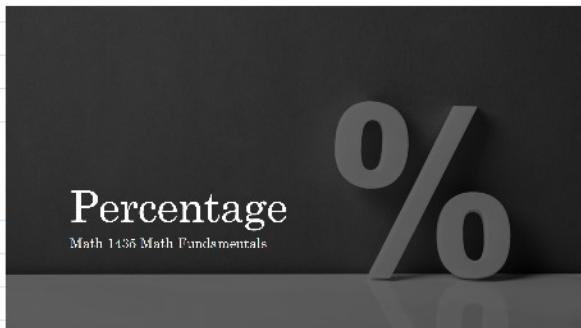
Before we start:

Announcements:

- Classes to remain online via Zoom (some link) at least until March 7<sup>th</sup>
- Tests will be through Online quizzes via eConestoga.
- Assignment submissions will also be through eConestoga.

Today:

1.



2.

## Percentage definition

- Percent means "per hundred". Percent is a type of fraction where the denominator is always 100.  $20/100 = 20\%$
- When written, we use the % sign instead of writing it as a fraction.
- Percentages can also be written as a decimal.
- Common uses for percentage in cabinet making are:
  - Waste factors of wood (solid & panel)
  - Waste factors of finishing materials
  - Calculation of consumables (% of total estimate to account for things like glue, pins, nails, screws, sand paper etc).
  - Overhead calculations for pricing/ estimating
  - Calculating taxes for paychecks & invoices



Notes:

- Percentage vs. Number

20%

$$20/100 = 0.2$$

## - Percentage vs. Number

20%

$$\frac{20}{100} = 0.2$$

$\frac{\text{Percent}}{100\%}$  → Number e.g.  $87\% = \frac{87}{100\%} = 0.87$

Number  $\times 100\% \rightarrow$  Percent% e.g.  $0.34 = \frac{34}{100} \rightarrow \frac{34 \times 100\%}{100} = 34\%$

- Sometimes Percentage can be more than 100%.

increase / decrease

3.

## Percentage to decimal

Changing a percentage to a decimal

- To change a percentage to a decimal simply divide the percentage by 100.
- Since 12% is equal to  $\frac{12}{100}$  we divide the numerator and denominator by 100 to find the decimal equivalent. Write the formula as follows:

$$12 \div 100 = 0.12 \text{ (move the decimal over 2 places)}$$

$$14\% = 0.14$$

$$65\% = 0.65$$

$$99\% = 0.99$$

$$312\% = 3.12$$

$$12\% \rightarrow 0.12$$



Practice. Convert the following numbers to decimals

(a) 10.09%

(b) 20.1%

(c) 64.5%

Soln:  $10.09\% = 0.1009$

$$20.1\%$$

$$64.5\%$$

$$= 0.201$$

$$= 0.645$$

4.

## Percentage – decimal to percent

Changing a decimal to a percentage

- To change a decimal to a percentage, multiply the decimal by 100.

$$0.13 \times 100 = 13\%$$

$$0.55 \times 100 = 55\%$$

$$3.22 \times 100 = 322\%$$

$$0.13 = 13\%$$

Some notes:

- if the number ends at the decimal (no numbers to the right of the decimal) then drop the decimal.



Some notes:

- if the number ends at the decimal (no numbers to the right of the decimal) then drop the decimal.
- When changing from a percent to decimal. Place a zero in the ones column if there are no whole numbers.

$$.65 = 0.65 = 65\%$$

Practice: Convert the following decimals into percents:

(a) 30.09

$$= 30.09 \times 100\%.$$

$$= 3009\%.$$

(b) 0.0743

$$0.0743 \times 100\%.$$

$$= 7.43\%.$$

(c) 0.815

$$0.815 \times 100\%.$$

$$= 815\%.$$

5.

## Percentage examples

Percentage examples

of  $\leftrightarrow$   $\times$   
multiplication

$$\text{eg. } 5\% \text{ of } 1500 = 0.05 \times 1500$$

- Your earn \$1500.00 per month. Your boss has given you a 5% pay increase. What will your new monthly pay be?  
 $\$1500.00 \times 0.05 = 75.00$  therefore your pay will increase by \$75.00. your new pay will be \$1575.00 ( $1500 + 75$ )
- You are required to order 477 bm of s&btr 4/4 walnut for a job. The shop averages 60% waste on solid lumber. How much walnut should you order?  
~~X~~  $477\text{bm} \times 0.6 = 286.2\text{bm}$  · Therefore, you need to order  $(477\text{bm} + 286.2\text{bm}) = 763.2\text{bm}$  of 4/4 walnut.

Let  $x$  be the amount of solid lumber that is needed

$$\text{Waste} = 60\% \text{ of } x = 0.6 \times x = 0.6x$$

times

$$\text{Rest} = x - \text{Waste} = x - 0.6x = (1 - 0.6)x = 0.4x$$

Practice:

$$\text{So } 0.4x = 477 \text{ then } x = \frac{477}{0.4} = 1192.5 \text{ is needed}$$

If  $\frac{16}{200}$  of 200 apples were bad, what percent is that?

$$\frac{16}{200} \times 100\% = 8\%$$

out of  $\leftarrow \div$

Peter scored 27 out of 50 in a test. What percent was that?

$$\frac{27}{50} \times 100\% = 54\%$$

Example: A Skateboard is reduced 25% in price in a sale.  
The old price was \$120.  
Find the new price.

$$\text{Old Price} = \$120$$

$$\text{Discount} = 25\% \text{ of } 120 = 0.25 \times 120 = 30$$

$$\text{New Price} = \text{Old Price} - \text{Discount}$$

$$= \$120 - \$30 = \$90$$

A TV originally cost \$400.  
If the price of the TV increases by 15%, what is the new price?

$$\$400 + (15\% \text{ of } \$400) = \$400 + \$60 = \$460$$



15% of the cost of a computer was tax. If the tax was \$180, what was the cost of the computer?

$$15\% \text{ of cost} = \text{tax}$$

$$0.15 \times \text{Cost} = \$180$$

$$\frac{0.15 \times \text{Cost}}{0.15} = \frac{\$180}{0.15}$$

$$\text{Cost} = \$1200$$



In a sale, the price of a coat was reduced by 25%.  
If Joe paid \$90 for the coat, what was its original price?

$$\text{Original Price} = \$x$$

$$\text{Reduction} = 25\% \text{ of Original Price} = 0.25 \times \$x$$

$$\text{Original Price} - \text{Reduction} = \text{New Price}$$

$$\$x - 0.25x = \$90$$

$$\$(1 - 0.25)x = \$90 \text{ so: } 0.75x = \$90 \text{ then } x = \frac{\$90}{0.75} = \$120$$

6.

## Solving percentage problems

- We can solve percentage problems by using the proportion:  $\frac{P}{B} = \frac{R}{100}$
- "P" is the part value.
- "B" is the base value.
- "R" is the percentage.
- Sample:
  - What is 25% of 143.
  - P= unknown (x), B= 143, R= 25%
  - $\frac{x}{143} = \frac{25}{100}$  Rearrange the formula to find x.
  - $x = \frac{143 \times 25}{100}$
  - X = 35.75

OK

7.

## Percentage formulas

- Using the proportion:  $\frac{P}{B} = \frac{R}{100}$  We can then find all of the variables.

- $P = \frac{R \times B}{100}$  (Example: What is 20% of 235?)

$$P = \frac{235 \times 20}{100} = 47$$

- $B = \frac{(P \times 100)}{R}$  (Example: 75 is 12% of what number?)

$$B = \frac{75 \times 100}{12} = 625$$

- $R = \frac{(P \times 100)}{B}$  (Example: What percent is 12 of 56?)

$$R = \frac{12 \times 100}{56} = 21.\overline{43}$$

Practice:  $P = \frac{B \times R}{100}$ ,  $B = \frac{P \times 100}{R}$ ,  $R = \frac{P \times 100}{B}$

Answer the following questions:

1: 24% of 27 =  $\frac{648}{100} = 6.48$

2: 20% of 17 = 3.4

3 is 18.75% of which number?

3. 3 is 18.75% of what number?

$$B = \frac{3 \times 100}{18.75} = 16$$

5 is 62.5% of which number?

4. 5 is 62.5% of what number?

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4. 5 is 62.5% of what number?

8

What % is 11 out of 16

5. What percent is 11 of 16?

$$\frac{11}{16} \times 100\% = 68.75\%$$

$$R = \frac{P \times 100}{B}$$

What % is 31 out of 8

6. What percent is 31 of 8?

$$\frac{31}{8} \times 100\% = 387.5\%$$

Exercise:

1. At a restaurant, after 13% tax, you paid \$130. What was the total price before tax?

$$115.04 \times \frac{13}{100} = 14.95 \approx 15 \\ 115 + 15 = 130$$

For tax/discount problems: if original is increased by R%, then

$$\text{original} = \frac{\text{Amount}}{1 + \frac{R}{100}}$$

$$\text{e.g. price before tax} = \frac{\$130}{1 + \frac{13}{100}} = \frac{\$130}{1 + 0.13} = \frac{\$130}{1.13} = \$115.04$$

What you did:  
 $\$130 \times 13\% = 16.9$   
 $180 - 16.9 = 163.1$

2. At Lowe's you paid \$200 on lumber after 20% discount.

What was the original price?

$$20\% \text{ of } 250 = \$50 \\ 250 - 50 = \$200$$

original is reduced:

$$\text{original} = \frac{\text{Amount}}{1 - \frac{R}{100}} = \frac{\$200}{1 - \frac{20}{100}} = \frac{\$200}{1 - 0.2} = \frac{\$200}{0.8} \\ = 250$$

$$\$200 \times 10\% = 20 \\ \$200 + \$20 = \$220$$

Before you leave:

- Test 1 next week, make sure to practice!

- We will do a short review (regular class zoom) from 3-3:40pm

- Test is for 1 hour from 3:45pm - 4:45pm.

- we will do a short review (regular class room) from 2-2:45pm
- Test is for 1 hour from 3:45pm - 4:45pm.
- Watch out for announcements on eConestoga!