



38% MATH 1030 #5a 17/100

Use and Abuse of Percentages

Percentage

142%

33<sup>1</sup>/<sub>3</sub>%

Percent means per 100 or out of 100.

$$p\% = \frac{p}{100} \quad \text{ex } 78\% = \frac{78}{100} = 0.78$$

Percents can be used to

- Describe a fraction of a total

ex I ate 25% of the pizza.

- Describe a change

ex As I have aged, my height is now only 95% of my height at age 20.

- Compare

ex Looking for my class textbook, I noticed the price at the campus store was 110% of the price online.

### Basic Percent Problem Set-up

$$\boxed{\frac{\text{part}}{\text{part}} \text{ is } \underline{\hspace{2cm}} \% \text{ of } \frac{\text{whole}}{\text{whole}}}$$

There are three questions to be asked:

1. There is a 40% discount on a \$500 item. What is the discount amount?

$$\underline{x} \text{ is } \underline{40} \% \text{ of } \underline{500}$$

$$x = 0.4(500)$$

$$x = \$200$$

2. Candy was eaten by 192 people at the Halloween party. That is 80% of the people in the town. How many people are in my town?

$$\frac{192}{\text{part}} \text{ is } \underline{80} \% \text{ of } \frac{x}{\text{whole}}$$

$$\frac{192}{0.8} = \frac{0.8x}{0.8} \Rightarrow x = 240$$

3. Macey scored 78 out of 120 on the last midterm. What percent is this?

$$\frac{78}{\text{part}} \text{ is } \underline{x} \% \text{ of } \frac{120}{\text{whole}}$$

$$\frac{78}{120} = \frac{x(120)}{120}$$

$$0.65 = x$$

$$(65\%)$$

EX 1: Determine an answer for each of these.

- a) Thirty-five students were absent. This was 5% of the students in the school. How many students are in the school?

$$\frac{35}{\text{part}} \text{ is } 5\% \text{ of } \frac{x}{\text{whole}}$$

$$\frac{35}{0.05} = \frac{0.05x}{0.05} \Rightarrow x = 700 \text{ students}$$

- b) The price of a gallon of milk fell 3% last week to \$3.80. How much was it prior to last week?

$$\frac{3.80}{\text{part}} \text{ is } 97\% \text{ of } \frac{x}{\text{whole}}$$

$$\frac{3.80}{0.97} = \frac{0.97x}{0.97} \Leftrightarrow x = \$3.92$$

- c) This light bulb will last 130% longer than the old one. The old one was good for 3 years. How long will this one last?

$$\frac{x}{\text{new}} \text{ is } 130\% \text{ of } \frac{3}{\text{old}}$$

$$x = 1.30(3) = 3.9 \text{ years}$$