

Assignment 4

Math 1030

Due Friday, September 21st

Name: Solutions

1. Basic Percentages

In each statement below, express the the number as a percentage of the second. (Problems 55 - 59 of section 3A in the textbook).

- (a) 220 men at a conference with 430 people.

$$220/430 = .512 = \boxed{51.2\%}$$

- (b) 123 varsity student athletes in a graduating class of 569.

$$123/569 = .216 = \boxed{21.6\%}$$

- (c) 145 Subarus in a parking lot with 436 cars.

$$145/436 = .333 = \boxed{33.3\%}$$

- (d) 190,000 people under 18 out of 807,000 people in Delaware.

$$190,000/807,000 = .235 = \boxed{23.5\%}$$

- (e) 2.8 million people over 65 out of 16.7 million people in Florida.

$$2,800,000/16,700,000 = .168 = \boxed{16.8\%}$$

- (f) 100,500 Native Americans out of 643,800 people in Alaska.

$$100,500/643,800 = .156 = \boxed{15.6\%}$$

2. Percentage Differences

Find the absolute and relative difference (as a percentage) in each case. Assume that the first quantity is the compared value and the second quantity is the reference value. (Problems 67 - 70 in section 3A of the textbook.)

- (a) The daily circulation of *USA Today* is about 2.20 million (the largest in the country). The daily circulation of the *New York Times* is about 1.12 million (the third largest in the country).

Bonus Point - What newspaper has the second largest circulation in the United States?

$$\frac{2.20 \text{ million} - 1.12 \text{ million}}{1.12 \text{ million}} \times 100\% = \boxed{96.4\%} \text{ more than NYT.}$$

Absolute \rightarrow $\boxed{1.08 \text{ million}}$ Bonus - $\boxed{\text{Wall Street Journal}}$

- (b) In a recent year, the United States made \$12.1 billion in international arms sales (46% of the total) and Russia made \$5.8 billion in arms sales (22% of the total).

$$\frac{\$12.1 \text{ billion} - \$5.8 \text{ billion}}{\$5.8 \text{ billion}} \times 100\% = \boxed{109\%} \text{ more than Russia}$$

Absolute \rightarrow $\boxed{\$6.3 \text{ billion}}$

- (c) In 2004, France ranked as the number one tourist destination, with about 77 million international arrivals. Spain ranked second, with about 50 million international arrivals.

$$\frac{77 \text{ million} - 50 \text{ million}}{50 \text{ million}} \times 100\% = \boxed{54\%} \text{ more than Spain}$$

Absolute \rightarrow $\boxed{27 \text{ million}}$ tourists

- (d) In 2003, Saudi Arabia produced 8.8 million barrels of crude oil per day, while the United States produced 5.7 million barrels per day.

$$\frac{8.8 \text{ million} - 5.7 \text{ million}}{5.7 \text{ million}} \times 100\% = \boxed{54.4\%} \text{ more than USA}$$

Absolute \rightarrow $\boxed{3.1 \text{ million}}$ barrels

3. Scientific Notation

Express each of the following numbers in scientific notation. (Question 28 from section 3B of the textbook.)

(a) 4327

$$4.327 \times 10^3$$

(b) 984.35

$$9.8435 \times 10^2$$

(c) 0.0045

$$4.5 \times 10^{-3}$$

(d) 624.87

$$6.2487 \times 10^2$$

(e) 0.1357

$$1.357 \times 10^{-1}$$

(f) 98.18004

$$9.818004 \times 10^1$$

4. Units Review with Scientific Notation

Note - Not all information needed for these conversions is provided. You might need to look some of it up.

- (a) One astronomical unit is the approximate average distance from the Sun to the Earth. It is 149.6 million km. Express this distance in inches using scientific notation.

$$(1.496 \times 10^8 \text{ km}) \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) \left(\frac{100 \text{ cm}}{1 \text{ m}} \right) \left(\frac{1 \text{ in}}{2.54 \text{ cm}} \right) = \boxed{5.89 \times 10^{12} \text{ in}}$$

- (b) Distance inside the atom are measured in terms of angstroms. One angstrom is one ten-billionth of a meter. Express one angstrom in terms of miles using scientific notation.

$$(1 \times 10^{-10} \text{ m}) \left(\frac{100 \text{ cm}}{1 \text{ m}} \right) \left(\frac{1 \text{ in}}{2.54 \text{ cm}} \right) \left(\frac{1 \text{ ft}}{12 \text{ in}} \right) \left(\frac{1 \text{ mile}}{5,280 \text{ ft}} \right) = \boxed{6.21 \times 10^{-14} \text{ miles}}$$