1. Express the following numbers in three forms: as a reduced fraction, as a decimal, and as a percentage. **(6 pts)**

    (a) $30\% = 0.3 = 3/10$.

    (b) $0.85 = 85\% = 85/100 = 17/20$.

    (c) $4/3 = 1.33 = 133\%$.

2. You are multiplying 1,277 times 14,385. You expect the answer to be a number between 1 and 10 times

    a. $10^3$.        b. $10^5$.        c. $10^7$.     **(2 pts)**

    $1,277 \times 14,385 > 1,000 \times 10,000 = 10^3 \times 10^4 = 10^7 > 10^6 = 10 \times 10^5 > 10^4 = 10 \times 10^3$.

    So the answer has to be c.

3. The number 70,000,000 is the same as

    a. $7 \times 10^7$.        b. $7 \times 10^8$.        c. $7 \times 10^9$.     **(2 pts)**

    $70,000,000 = 7 \times 10^7$.

4. Find the absolute change and the percentage change if the number of daily newspapers in the United States was 2,226 in 1900 and 1,420 in 2010. **(4 pts)**

$$absolute\ change = 1,420 - 2,226 = -806.$$

$$relative\ change = \frac{-806}{2226} = -0.362 = -36.2\%.$$

5. You purchase a bicycle with a retail (pre-tax) price of $760. The local sales tax rate is 7.6%. What is the final cost? **(4 pts)**

$$final\ cost = (100 + 7.6)\% \times \$760 = 107.6\% \times \$760 = 1.076 \times \$760 = \$817.76.$$

6. Simon's monthly take-home pay (after taxes) is $2,200. If he pays 21% of his gross pay (before taxes) in tax, what is his gross pay? (**4 pts**)

$$\$2,200 = (100 - 21)\% \times gross$$
$$\$2,200 = 79\% \times gross$$
$$\$2,200 = 0.79 \times gross$$
$$gross = \frac{\$2,200}{0.79} = \$2,784.81.$$

7. Find the scale ratio for the map where 1 inch on the map represents 10 miles. (**4 pts**)

$$10\,mi \times \frac{5,280\,ft}{1\,mi} \times \frac{12\,in.}{1\,ft} = 633,600\,in.$$

So the ratio is $1 : 633,600$.