Math 310 - Dr. Miller - Homework #17: Percent Reasoning and Basic Applications

1. Two quantities are described in each part below. Decide whether the first is larger than, smaller than, or equal to the second.
   (a) A number, or 30% of that number
   (b) A number, or 500% of that number
   (c) 30% of a number, or 0.03 times the number
   (d) 1.5 times a number, or 1.5% of the number
   (e) A number plus 30% of itself, or 130% of the number
   (f) A number minus 50% of itself, or 75% of the number
   (g) 150% of a number, or 2 times the number
   (h) 105% of a number, or 1.5 times the number
   (i) 1.05% of a number, or the original number
   (j) One third of a number, or 30% of a number
   (k) 30% of 50% of a number, or 20% of the number
   (l) 50% of 150% of a number, or the original number
   (m) 40% of a number, or 20% of 20% of the number
2. (a) x is 75% of a number. Is the number more or less than x?
   (b) y is 105% of a number. Is the number more or less than y?
   (c) If x is a positive number, is $x + 1$ more or less than 100% of x?
   (d) If you take 10% of $10x$, how does the result compare to x?
   (e) If you take 10% of $10 + x$, how does the result compare to x?
3. Solve these non-contextual problems.
   (a) What number is 18.3% of 50?
   (b) What percent is 18.3 of 50?
   (c) 13.8 is 50 % of what number?
   (d) 65% of 120 is what?
   (e) 75 is what percent of 120?
   (f) 65 is 18% of x. What is x?
4. Solve:
   (a) Jodi had 180 candy bars at the start of trick-or-treating, and 35 were left at the end. Is this a percent increase or decrease, and by what percent (to the nearest tenth of a percent)?
   (b) New homes in Outer County cost an average of \$180,000 in 2016 and \$155,000 in 2015. Is this a percent increase or decrease, and by what percent (to the nearest tenth of a percent)?
   (c) Enrollment at Suburb Elementary School was 536 in 2019 and 589 in 2020. Is this a percent increase or decrease, and by what percent (to the nearest tenth of a percent)?
   (d) Dianne used to have 1017 comics in her collection, and now she has 1306. Is this a percent increase or decrease, and by what percent (to the nearest tenth of a percent)?

1. (a) The number is larger than 30% of that number.
   (b) The number is smaller than 500% of that number.
   (c) 30% of a number is larger than 0.03 times the number. (0.03 times the number is only 3%.)
   (d) 1.5 times a number is larger than 1.5% of the number. (1.5 times the number is 150%.)
   (e) A number plus 30% of itself is equal to 130% of the number.
   (f) A number minus 50% of itself is smaller than 75% of the number. (A number minus 50% of itself leaves only 50%.)
   (g) 150% of a number is smaller than 2 times the number. (2 times the number is 200%.)
   (h) 105% of a number is smaller than 1.5 times the number. (1.5 times the number is 150%.)
   (i) 1.05% of a number is smaller than the original number. (The original is 100%, not 1%.)
   (j) One third of a number is larger than 30% of a number. (One third of a number is $33\frac{1}{3}$%.)
   (k) 30% of 50% of a number is smaller than or 20% of the number. (30% of 50% is $0.3 \times 0.5 = 0.15 = 15\%$.)
   (l) 50% of 150% of a number is smaller than the original number. (50% of 150% is $0.5 \times 1.5 = 0.75 = 75\%$ of the number.)
   (m) 40% of a number is larger than 20% of 20% of the number. (20% of 20% is $0.2 \times 0.2 = 0.04 = 4\%$.)
2. (a) The number is more than x.
   (b) The number is less than y.
   (c) $x + 1$ is more than 100% of x.
   (d) It equals x.
   (e) It is probably less than x. (Unless x is already a very tiny decimal...)
3. (a) 9.15
   (b) 36.6%
   (c) 27.6
   (d) 78
   (e) 62.5%
   (f) $361\frac{1}{9}$
4. (a) decrease, 80.6%
   (b) increase, 16.1%
   (c) increase, 9.9%
   (d) increase, 28.4%