Section: \_\_\_\_\_

## Math 111

## Group Activity: Percent and Proportionate Change

Suppose you are awarded a 5% raise in your salary. We call 5% the **percentage change** (or just **percent change**) in your salary and that percentage expressed as a decimal, 0.05, the **proportionate change**. To compute your NEW salary, add your OLD salary to the dollar amount of the raise, which is 5% of your OLD salary:

$$NEW = OLD + 0.05 \cdot OLD.$$

1. If your current annual salary is \$38,000, what is your salary after a 5% raise?

2. You inherit a diamond ring appraised at \$5000. Diamonds are expected to appreciate by 8% per year. What would you expect the ring to be worth in one year?

3. You plan to buy a TV that is regularly priced at \$450. The store is offering 25% off every product in the store. What is the sale price of the TV? (HINT: You can still use an equation similar to the salary equation. But, since this is a reduction in the cost of the TV, your proportionate change is *negative*.)

4. In general, if a quantity changes by  $p \times 100\%$  from an OLD value to a NEW value,

## NEW=OLD+p·OLD.

Solve this equation for the proportionate change, p.

- 5. Use either the formula, NEW=OLD+p·OLD or the formula you found in #4 to answer the following questions.
  - (a) The population of a town was 4000 people in 2010 and 4093 in 2012. What was the percentage change in the population?

(b) A pair of shoes that regularly costs \$103 is on sale for \$60. What percent savings is this? (Again, your proportionate change will be *negative*.)

(c) A business purchased for \$650,000 in 1994 sold for \$850,000 in 1997. What was the percent change in its value?

(d) A collectible lunchbox increases in value by 1.4% per year. If it is worth \$507 one year from now, what is its value today?

(e) You start a new job with a starting salary of \$40,000 and a 2% cost-of-living raise each year. Fill in the following table:

t (in years)	salary after $t$ years	dollar amount of raise
0	\$40,000	$$40,000 \cdot 0.02 = $800$
1	\$40,800	$$40,800 \cdot 0.02 =$
2		
3		
4		

Is it true that a salary that increases by 2% per year increases by 8% in four years? Explain.