Algebra II Honors – Warm-Ups – Thursday, February 11, 2021
You many use a full sheet of paper – these will become notes for section 7-1!
Mr. Allen-Black wants to buy a super-nifty disco shirt.

The shirt was found online for a very reasonable price of $120. For each of the following situations, find a **multiplier** (That is one number that I can multiply the price by, in order to find the new cost, <u>using just ONE step</u>!)

1) Mr. Allen-Black has to include a 7% sales tax on the shirt. What multiplier will find the cost of the shirt with the tax included?

2) There is a shipping fee, which is based on 10% of the price of the product. Find the multiplier that will find the cost of the shirt with the shipping fee included. (Don't include sales tax.)

3) For a limited time, the shirt is being sold for 15% off the listed price. Find the multiplier that will find the pre-tax cost of the shirt with the discount applied.

Extension: Since the shirt has been discontinued, the online retailer will be taking 10% off of the price of the shirt at the end of each week, until it sells. How much will the shirt cost after the 5th week discount has been taken?

I. Exploring Multipliers.   Find the multiplier that would help you to calculate:

1)   a 24% price increase.

2)   a population decline of 7%

3)   .05% inflation rate

4)   5.4% decay

5)   200% increase

6)   a 2½% service fee off of your bank account balance

II. Writing Exponential Functions:

7) At the point of purchase, a car was worth $34,000.   The car depreciates at a rate of 4% every month.

   a) Write an equation which models the value of the car over time.

   b) How much would the car be worth in 5 months?

   c) How much would the car be worth in 2 years?

8) Mr. Allen-Black has a farm with 24 rabbits.   The rabbits' population is expected to grow at a rate of 22% each month.

   a) Write an equation which models the rabbit population over time.

   b) How many rabbits would Mr. Allen-Black have in one year?

   c) How long would it take the population to double?

9) In Madagascar, the Ring-Tailed Lemur population is in danger. There are currently only 17,200 lemurs left. That population is declining at a rate of 12% each year.

    a) Write an equation which models the lemur population over time.

    b) How many lemurs will be left in 5 years?

    c) About how long will it take for there to be only 5000 ring-tailed lemurs left in Madagascar?

10) The Plutonium in Doc Brown's DeLorean has a half-life of 45 days. (In 45 days, half of the Plutonium would have decayed away.)

    a) If he started with 108 grams of Plutonium, how much Plutonium would be left in 90 days?

    b) If he started with 108 grams of Plutonium, how much would be left in 200 days?

11) Ms. Gulamali started a savings account with $8,000. The account earns 8% interest (a.p.r.). How much money will she have after 12 years if....

     a) The interest is compounded annually?

     b) The interest is compounded quarterly?

     c) The interest is compounded monthly?

     d) The interest is compounded daily?

     e) The interest is compounded CONTINUOUSLY???