Percent Change/Weighted Average[1]
In-Class Problem[2]

Percent Change

1. Last year the Westminster Gala event had 1,535 attendees. This year 1,610 people attended the gala. What is the percent change in attendance? *Please show your answer as a percentage rounded to two decimal places.*

   P1 = 1535, P2 = 1610
   $\% \, Change = (P2 - P1) \, P1 * 100 = (1{,}610 - 1{,}535) / 1{,}535 * 100 = 0.04886 * 100 = 4.89\%$

2. Ron Weasley sells homemade holiday sweaters made by his mother. Last Christmas he sold 37 sweaters and this year he sold 32. What is the percent change in sweater sales from last year to this year? *Please show your answer as a percentage rounded to two decimal places.*

   P1 = 37, P2 = 32
   $\% \, Change = (P2 - P1) \, P1 * 100 = (32 - 37) / 37 * 100 = -0.13514 * 100 = -13.51\%$

3. Yesterday they sold 78 lattes at the Griffin's Roost and today they sold 89 of them. What is the percent change in sales from yesterday to today? *Please show your answer as a percentage rounded to two decimal places.*

   P1 = 78, P2 = 89
   $\% \, Change = (P2 - P1) / P1 * 100 = (89 - 78) / 78 * 100 = 0.14103 * 100 = 14.10\%$

4. Each year a number of local children audition to be in Ballet West's performance of *The Nutcracker.* Last season there were 22 ballerinas auditioning to be the Sugar Plum Fairy. This season there were 48 ballerinas who auditioned for the same part. What is the percent change from last season? *Please show your answer as a percentage rounded to two decimal places.*

   P1 = 22, P2 = 48
   $\% \, Change = (P2 - P1) / P1 * 100 = (48 - 22) / 22 * 100 = 1.18182 * 100 = 118.18\%$

5. After an increase of 40%, the number of items purchased this year by a shopper on Black Friday was 112. How many items did the shopper purchase last Black Friday? *Please show your answer as a percentage rounded to two decimal places.*

   P2 = 112, % Change = 40%
   $(P2 - P1) / P1 = \% \, Change$

Substitute known values

$(112 - P1) / P1 = 0.40$

$112 - P1 = 0.40\ P1$

$112 = 1.40\ P1$

$112/1.40 = 80 = P1$

Weighted Average

Suppose you have the following credit card accounts with the balances and interest rates noted:

Credit Card	Interest Rate	Balance
Visa	21.4%	$1,500
American Express	18%	$800
Discover	19.2%	$2,000

6. What is the average interest rate on your credit cards? *Provide your answer as a percentage rounded to two decimal places*

    (.214 + .18 + .192)/3 = .1953 or 19.53%

7. What is the average balance of your credit cards? *Provide your answer in dollar terms rounded to the cent.*

    (1,500 + 800 + 2,000)/3 = $1,433.33

8. What percent of the overall credit card balance is represented by each of the three card balances? *Provide your answer as a percentage rounded to two decimal places*

    1500 + 800 + 2000 = 4300
    Visa: 1500/4300 = .3488 or 34.88%
    American Express: 800/4300 = .186 or 18.6%
    Discover: 2000/4300 = .4651 or 46.51%

9. What is the weighted average interest rate on your credit cards? *Provide your answer as a percentage rounded to two decimal places*

    (.3488 x .214) + (.186 x .18) + (.4651 x .192) = .1974 or 19.74%

10. Explain why the weighted average cost of interest is different than the average interest rate?

    Answers will vary

    While the average of the three interest rates is 19.53% this is only one third of the total of the rates. The balance represented by the highest rate card is more than one third of the total balance. This weights the cost of interest towards the higher of the rates.