Econ 102 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Summer 2013

Answers to Quiz #0

Please write all answers neatly and legibly.

1. Suppose that you are told that the point (8, 10) sits on a straight line. Furthermore you are told that every time the X value increases by 5 units the Y value decreases by 10 units. Write an equation in slope intercept form given this information. Show your work and explain the steps you used to find your answer.

Answer:

From the information you know (X, Y) = (8, 10) is on the line. You need to find one more point on the line in order to calculate the slope of the line, the y-intercept and finally an equation for the line. From the information you could get the slope as -10/5 or -2. Looking for that second point, we know that if X increase by 5 units from 8 units, the X value will be 13. If Y is initially equal to 10 units, then the Y value will decrease by 10 units when X increase from 8 to 13 units: the new Y value when X is equal to 13 will be 0. Thus, the point (13, 0) also sits on this line. We can calculate slope: slope = (10 – 0)/(8 – 13) = -2. The equation can be written as Y = b – 2X and using the point (8, 10) we have: 10 = b – 2(8) or b = 26. Thus, the equation is Y = 26 – 2X.

2. In Mary’s econ class her first exam had a total of 40 points on it and she scored a 35 on this exam. Her second exam had a total of 60 points on it and she scored a 54 on this exam. Her final exam will have a total of 80 points. The two midterms are each worth 25% of her grade while the final is worth 50% of her grade where these weights are based on 100 point exams. If Mary needs a weighted average of 90 points on a 100 point scale to earn an A in the class, what score will she need to make on her final? Show how you found your answer the steps you took to get your answer.

Answer:

First, let’s convert the two midterms to a 100 point scale as well as Mary’s two scores on these midterms to scores on a 100 point scale:

(First Midterm)(Scale Factor) = 100 points

(40 points)(Scale Factor) = 100 points

Scale Factor = 2.5

(Mary’s First Midterm Score)(Scale Factor for First Midterm) = Mary’s Score on First Midterm using 100 point scale

(35)(2.5) = 87.5 points on the first midterm when on a 100 point scale

(Second Midterm)(Scale Factor) = 100 points

(60 points)(Scale Factor) = 100 points

Scale Factor = 5/3 (leaving this as a fraction will be easier than using a decimal)

(Mary’s Second Midterm Score)(Scale Factor for Second Midterm) = Mary’s Score on Second Midterm using 100 point scale

(54)(5/3) = 90 points on the second midterm when on a 100 point scale

Now, let’s convert the final exam points to a 100 point scale:

(Final Exam)(Scale Factor) = 100 points

(80 points)(Scale Factor) = 100 points

Scale Factor = 1.25

Then, we need to compute the needed weighted average for the three exams: thus,

(First Midterm Score on a 100 point scale)(.25) + (Second Midterm Score on a 100 point scale)(.25) + (Final Exam Score on a 100 point scale)(.5) = Required Score for an A

87.5(.25) + 90(.25) + (Final Exam Score on a 100 point scale)(.5) = 90

21.875 + 22.50 + (Final Exam Score on a 100 point scale)(.5) = 90

(Final Exam Score on a 100 point scale)(.5) = 45.625

Final Exam Score on a 100 point scale = 91.25

Now we need to convert the final exam score from a 100 point scale to an 80 point scale:

[(Needed Score on Final Exam on a 80 point scale)/(80 points)] = [(91.25)/(100)]

Needed Score on Final Exam on a 80 point scale = 73

3. You are given these two points that sit on a straight line that we will refer to as line 1: (X, Y) = (10, 10) and (20, 30). You are given two more points that sit on a straight line that we will refer to as line 2: (X, Y) = (-10, 0) and (20, -30). Find the (X, Y) where line 1 and line 2 intersect given this information. Show your work.

Answer:

We will need to write an equation for line 1 and an equation for line 2 in order to find (X, Y) where these two lines intersect. For line 1, we have slope = (10 -30)/(10 – 20) = 2. Line 1 can therefore be written as Y = 2X + b and then using one of the given points we have 10 = 2(10) + b or b = -10. Thus, line 1 is given by the equation Y = 2X – 10.

For line 2, we have slope = (0 – (-30))/(-10 – 20) = -30/30 = -1. Line 2 can therefore be written as Y = b – X and then using one of the given points we have 0 = b – (-10) or b = -10. Thus, line 2 is given by the equation Y = -10 – X.

Using these two equations to find the solution we have:

2X – 10 = -10 – X

3X = 0

X = 0

Y = -10 – X = -10 – 0 = -10

Or, Y = 2X – 10 = 2(0) – 10 = -10

(X, Y) = (0, -10)

4. Calculate the numeric values or simplify the following:

 a. Given the following information find the value of X.

(1/2)X + 20 = (1/4)X – 12

Answer:

2X + 80 = X – 48

X = -128

 b. Given the following information simplify this expression:

 2x(x + x + x)/4x =

Answer:

2x(3x)/4x =

6x\*x/4x =

(3/2)x

 c. Given the following information simplify this expression:

 ((1/2)X + (1/4)Y)/2 =

Answer:

[(1/2)X/2] + [(1/4)Y/2] =

(1/4)X + (1/8)Y

d. Joelle spent $25.00 at the restaurant Saturday night on her meal. She decided to tip 20% for the service she received. What was the amount of the tip she paid?

Answer:

Tip = (.20)(25.00) = $5.00