Economics 102 Name _____

Summer 2015

Answers to Quiz #0

Monday, June 22, 2015

Please write your answers neatly and legibly.

1. (1 point) Suppose you are given two equations:

    Y = 100 – 3X
    Y = 20 + 2X

Find where these two lines intersect and provide the coordinates for this point (X, Y). For full credit show your work.

Answer:

To find where these two points intersect set the two equations equal to one another and solve:

100 – 3X = 20 + 2X

80 = 5X

X = 16

Then, put X = 16 into either equation to find the Y value: thus,

Y = 100 – 3(16) = 52

Or, Y = 20 + 2(16) = 52

(X, Y) = (16, 52)

2. (1 point) This is a multiple choice question (circle the correct answer): Suppose you are given the following information about the price of bicycles in the economy of Supplia.

Year	Price of A Bicycle
2013	$200
2014	$220
2015	$240

Which of the following tables is most accurate given the above information?

a.

Year	Percentage Change From Previous Year
2013	----
2014	20%
2015	40%

c.

Year	Percentage Change From Previous Year
2013	----
2014	10%
2015	Less than 10%

b.

Year	Percentage Change From Previous Year
2013	----
2014	10%
2015	10%

d.

Year	Percentage Change From Previous Year
2013	----
2014	10%
2015	More than 10%

3. (1 point) You are told that when interest rates are 10% that the demand for loans is equal to $10,000. And, when interest rates are 5%, the demand for loans is equal to $20,000. Assume that the demand for loans is linear. Given this information, at what interest rate does the demand for loans equal $0? For full credit show or describe how you found your answer.

Answer:

Suppose that r is the symbol we use for interest rates and Q is the symbol we use for the amount of loans demanded. From the above information we have two sets of (Q, r) values that sit on the linear line depicting the demand for loans: (Q, r) = ($10,000; 10) and ($20,000; 5). We can use these two points to write an equation for this relationship. First, calculate a slope: m = rise/run and if we have interest rates on our vertical axis (an interest rate is simply the price of money) then our slope would be (10 – 5)/(10,000 – 20,000) = -5/10,000 = -1/2000. We can then write the equation for the demand for loans as: r = b + (-1/2000)Q where b is the y-intercept for this demand curve. Then to find the value of this y-intercept we could plug in one of our known points that sits on this line: for example, 5 = b + (-1/2000)(20,000) or b = 15. This tells us that when the interest rate is 15%, the quantity of loans demanded is equal to $0.

Alternatively, you could sketch a picture of the two points you were given and extrapolate what the interest rate would need to be in order for there to be no demand for loans. If at 5% the demand is $20,000; and at 10%, the demand is $10,000; then at 15% the quantity demanded should decrease by $10,000 or, in other words, the quantity of loans demanded will be $0! No need to derive the equation for this one!

4. (1 point) Suppose you are given the line:
        Y = 10 – 2X
You are then told that something happened so that for every Y value the X value has now increased by 30. What is the equation for this new line? For full credit show how you found your answer.

Answer:
If the X value increases by 30 units for every Y value this means that the new line is parallel and to the right of the first line. If the two lines are parallel than both lines have the same slope. Thus, the second line must be Y = b – 2X. To find the value of the y-intercept for this second line we need to have a point that sits on this second line. So, from the first line we know that if Y = 10, then X = 0. Thus, (X, Y) = (0, 10) sits on the first line and if the X value is 30 greater for every Y value on the second line, this tells us that the point (X', Y) = (30, 10) sits on the second line. Use this point to find the value of the Y-intercept:
10 = b – 2(30)
70 = b
The new line can be written as: Y = 70 – 2X.

5. (3 points) Suppose you are told that the points (X, Y) = (10, 10) and (40, 5) sit on a straight line. Given this information, write an equation for this line in slope-intercept form. For full credit show how you

found your answer. [Note: it is okay to leave any fraction as an improper fraction in this question.] After you write the equation, provide proof that both of the given points sits on this line!

Answer:
We can write the general formula for a straight line in slope-intercept form as Y = mX + b. We can calculate the slope of this line as m = rise/run = (10 – 5)/(10 – 40) = -5/30 = -1/6. Thus, our line is now written as: Y = b + (-1/6)X. Now, substitute in one of our given points to find the value of b, the y-intercept. Thus, 10 = b + (-1/6)(10) or b = 35/3. The equation for this line can be written as Y = 35/3 – (1/6)X.

To prove that the given points sit on the line described by this equation start by substituting in X = 10 into the equation. If this equation is accurate we should find that the Y value is 10. So:
Y = 35/3 – (1/6)(10)
Y = 35/3 – 5/3
Y = 30/3 = 10!
Now, repeat this process but this time substitute in X = 40 into the equation. If this equation is accurate we should find that the Y value is 5. So:
Y = 35/3 – (1/6)(40)
Y = 35/3 – 20/3
Y = 15/3 = 5!

6. (3 points) Professor Kelly is amazed every semester to see that some students decide not to do some of their assignments. This summer your grade is based upon doing five homeworks that are each worth 2 points on a 100 point scale, four quizzes that are each worth 2.5 points on a 100 points scale, 2 midterms that are each worth 25 points on a 100 point scale, and a final that is worth 30 points on a 100 point scale. For this question we will consider three hypothetical students that take this summer school class.

Jake takes the class and does all assignments: here are his results.
       Scores on Homeworks: 2; 2; 2; 2; 2
       Scores on Quizzes: 2; 2; 1; 1
       Score on First Midterm: 80
       Score on Second Midterm: 80
       Score on Final: 80
Mary takes the class and does not do all the assignments: here are her results.
       Scores on Homeworks: 0; 0; 0; 0; 0
       Scores on Quizzes: 2; 2; 1; 1
       Score on First Midterm: 80
       Score on Second Midterm: 80
       Score on Final: 80
Bethany takes the class and does not do all the assignments: here are her results.
       Scores on Homeworks: 0; 0; 0; 0; 0
       Scores on Quizzes: 0; 0; 0; 0
       Score on First Midterm: 80
       Score on Second Midterm: 80
       Score on Final: 80

Given the above information, calculate the final weighted score for each of these individuals. For full credit show all of your work in an orderly and easy to follow manner. Make sure the grader knows whose score you are computing. Once you have done the calculation, answer the following question:

Is there much of a penalty for not doing the assignments in Professor Kelly's class? Explain your answer fully using evidence and clear expression.

Answer:
Here is the basic calculation:
(Sum of Homework Scores) + (Sum of Quiz Scores) + .25(First Midterm Score) + .25(Second Midterm Score) + .3(Final Exam Score) = Weighted Score in Class

For Jake:
$10 + 6 + .25(80) + .25(80) + .3(80) = 80$

For Mary:
$0 + 6 + .25(80) + .25(80) + .3(80) = 70$

For Bethany:
$0 + 0 + .25(80) + .25(80) + .3(80) = 64$

Response Answer: There is a significant penalty for not doing the assignments in Professor Kelly's class. The students who elect to miss homeworks and/or quizzes are significantly hurting their grades. Professor Kelly believes that it is important that you "actually show up for the game" and she will provide incentives to students who do show up. Students who attend class, do the assigned work, put in the required effort will get a grade boost. Students who do not attend class, fail to turn in assigned work, put in little effort on assignments will find that their grades are hurt because of these decisions.