

Question 1:

(a)[2] Determine the slope of the line through the points $(-1, 4)$ and $(1, 6)$.

(b)[2] Determine an equation of the line having slope -7 and y -intercept $(0, -3)$.

(c)[2] Determine an equation of the vertical line through the point $\left(\frac{1}{2}, 3\right)$.

(d)[2] Determine the x -intercept of the line $y - 6 = -2(x + 3)$.

(e)[2] Determine the slope of the line $4x + 3y = 24$.

Question 2:

(a)[4] Determine whether the following lines are intersecting, parallel or coincident:

$$L : -3x + 12y = 4$$

$$M : 6x + 8y = 1$$

(b)[3] Determine an equation of the line through the point $(1, 1)$ which is parallel to the line with x -intercept $(-2, 0)$ and y -intercept $(0, 1)$.

(c)[3] Determine the point of intersection of the line of slope zero through $(3, 2)$ and the line with slope undefined through $(-2, -3)$.

Question 3:

(a)[5] \$10,000 is invested in a mix of two investments. One investment pays interests at an annual rate of 8%, while the second pays 12%. If \$1000 in interest is earned during the first year, how much was invested in each of the investments? Clearly define your variables and state a clear conclusion.

(b)[5] A store sells cashews for \$5.00 per pound and peanuts for \$1.50 per pound. 30 pounds of peanuts will be mixed with some cashews and the mixture will sell for \$3.00 per pound. How many pounds of cashews should be mixed with the peanuts so that the sale of the mixture will produce the same revenue as would selling the ingredient nuts separately?

Question 4:

(a)[5] A doughnut shop sells doughnuts for \$3.29 per dozen. The shop has fixed weekly costs of \$650 and it costs \$1.55 to make a dozen doughnuts. How many dozen doughnuts must be sold each week in order for the business to break even? Round your final answer to the nearest dozen.

(b)[5] Solve the following system of equations using any method you wish. Based on your solution, state whether the system is consistent or inconsistent.

$$3x - 6y = 2$$

$$5x + 4y = 1$$

Question 5:

(a)[5] A company has data indicating that when the price of a particular product is \$138 the quantity demanded is 72 while the quantity supplied is 96. At the market (or equilibrium) price of \$120 the quantity demanded increases to 88. Determine the supply equation for the product.

(b)[5] In 1990, 322 out of every 100,000 people in the United States died of heart disease. By 2004 that number had dropped to 217 out of every 100,000 people. Assuming a linear relationship between time (in years) and deaths due to heart disease, predict the number of deaths per 100,000 people that would be expected in the year 2010.