Algebra I Homework #8

1) Hannah leaves a town at 6 a.m., going 48 mph, traveling east. Joshua leaves the same town at 8 a.m. going 73 mph, traveling in the same direction. What time of day will it be when Joshua is 79 miles ahead of Hannah?

2) Natalie has 16 pounds of almonds that cost $6.25 per pound. She wants to add some cashews that cost $9.25 per pound. How many pounds of cashews does she have to add in order to get a mixture that costs $8.50 per pound?

3) How much 28% acid solution should be mixed with 18 gallons of a 72% acid solution in order to make a 46% acid solution?

4) Collin has $5.61 in her pocket consisting of quarters, dimes, and pennies. If the amount of quarters is three less than triple the amount of pennies and the amount of dimes she has is six more than double the amount of pennies, how many of each type of coin does she have?

5) How much 32% acid solution should be mixed with some pure acid in order to make 72 gallons of a 49% acid solution?

6) B varies directly as the cube root of C and inversely as the square of D. If B = 6 when C = 8 and D = 3, find the constant of variation, K, and write the equation of variation.

7) Aiden's grade on this test, X, varies directly as the amount of hours he studies, Y, and inversely as the square root of the amount of time he spends watching television, Z. Find the equation of variation if Aiden spends 10 hours studying, 1 hour watching television, and he gets a 90 on the test. If Aiden actually spends 6 hours studying and 4 hours watching television, what grade will Aiden earn on this test?

8) Y varies jointly as the cube of M and the square root of N and inversely as the square of W. If Y = 14 when M = 4, N = 25, and W = 2, find the equation of variation. If W = 7, while M = 5 and N = 16, find Y.

9) The volume of a certain gas, V, varies directly as the temperature, T, and inversely as the pressure, P. Find the equation of variation if, when the gas is heated to 200 degrees and has 300 lbs of pressure exerted on it, it has a volume of 50 cubic centimeters. If the gas is heated to 350 degrees and the pressure is decreased to 25 lbs, what would the volume of the gas become?

10) P varies directly as the square of G, inversely as the square root of E, and inversely as F. If P = 12 when G = 4, E = 9 and F = 6, find the constant of variation, K, and write the equation of variation.

11) A study concludes that the amount of hours you sleep at night varies directly as the square root of the amount of hours of exercise you get during the day and inversely as the square of the amount of cups of coffee you drink during that day. Find the equation of variation if, when you exercise for 9 hours and drink 3 cups of coffee, you get 9 hours of sleep. If you exercise for only 1 hour and drink 4 cups of coffee, how many hours of sleep would you get?

12) C varies jointly as R and the cube of H and inversely as the square root of T. If C = 21 when R = 14, H = 2, and T = 16, find the equation of variation. If T = 1, while H = 3 and R = 2, find C.

13) A study concludes that a person's weight varies directly as the amount of calories a person consumes each day and inversely as the square root of the number of hours of exercise that person gets each day. Find the equation of variation if, when a person exercises for 9 hours per day and consumes 1500 calories per day, that person weighs 150 lbs. If that person were to exercise for only 1 hour per day and consume 2000 calories per day, how much would that person weigh?

14) Z varies jointly as the cube root of V and the cube of X and inversely as the square of W. If Z = 4 when V = 64, X = 3 and W = 4, find the constant of variation, K, and write the equation of variation.

15) A study reveals that a person's longevity, L, varies jointly as the amount of miles the person walks per day, M, and the square root of the amount of pound of fruits and vegetables, F, the person consumes per week, and inversely as the square of the amount of ounces of candy eaten by the person per day, C. Find the equation of variation if a person walks 5 miles per day, eats 9 pounds of fruits and vegetables per week, consumes 2 ounces of candy per day, and lives to be 90 years old. If Rebecca walks 9 mile per day, eats 4 pounds of fruits and vegetables per week, and consumes 3 ounce of candy per day, how old can she expect to live?

16) M varies directly as the square of P, inversely as the square root of E and inversely as B. If M = 16 when P = 8, E = 169, and B = 4, find the equation of variation. If B = 12, while E = 64 and P = 6, find M.

17) The growth rate of a certain type of tree varies jointly as the square root of the average daily temperature and the square of the average monthly rainfall and inversely as the elevation where the tree is growing. Find the equation of variation if a tree growing at an elevation of 3,600 feet with an average daily temperature of 36 degrees Fahrenheit and gets an average of 3 inches of rain per month, grows at a rate of 8 inches per year. If that same tree was growing at an elevation of 6,400 feet with an average daily temperature of 81 degrees Fahrenheit and gets an average of 4 inches of rain per month, how many inches per year would the tree grow?

18) H varies jointly as N and D and inversely as W. If H =32 when N = 24, D = 6 and W = 72, find the constant of variation, K, and write the equation of variation.

19) The amount of bacteria on a certain surface varies jointly as the temperature of the surface and the square root of the humidity level and inversely as the square of the level of antibacterial agents on the surface. Find the equation of variation if the surface temperature is 80 degrees Fahrenheit, the humidity level is 64, there are 4 antibacterial agents on the surface, and there are 4,800 bacteria on the surface. If that same surface is actually at a temperature of 60 degrees Fahrenheit, the humidity level is 25, and there are 6 antibacterial agents on the surface, how many bacteria are there?

20) E varies jointly as the cube root of F and the cube of M and inversely as the square of G and inversely as the square root of V. If E = 49 when F = 343, M = 3, G = 9 and V = 4, find the equation of variation. If V = 81, while G = 8, M = 4, and F =64, find E.