Math 101 Supplement #2 **Name**_____

Direct and Joint Variation **Due** _____

Part I. Find the constant of proportionality, k, then solve for the indicated value.

1. y varies directly as x. $y = 65$ when $x = 5$. Find y when $x = 12$.

2. y varies directly as x. $y = 45$ when $x = 5$. Find y when $x = 13$.

3. y varies jointly as x and z. $y = 25$ when $x = 2$ and $z = 5$. Find y when $x = 8$ and $z = 12$.

4. C varies jointly as A and T. $C = 175$ when $A = 2100$ and $T = 4$. Find C when $A = 2400$ and $T = 6$.

Part II. Write an equation that expresses each relationship. Then solve the equation for y.

5. x varies jointly as y and the square of z.

6. x varies jointly as z and the difference of y and w.

Part III. Use a variation equation to find the constant of variation (proportionality), k. Then use k to solve the problem.

7. An alligator's tail length, T varies directly as its body length, B. An alligator with a body length of 4 feethas a tail length of 3.6 feet. What is the tail length of an alligator whose body length is 6 feet.

8. On a dry ashpalt road, a car's stopping distance varies directly as the square of its speed. A car traveling at 45 miles per hour can stop in 67.5 feet. What is the stopping distance for a car traveling at 60 miles per hour?

9. The heat loss of a glass window varies jointly as the window's area and the difference between the outside and inside temperatures. A window 3 feet wide by 6 feet long loses 1200 Btu per hour when the temperature outside is 20 degrees colder than the temperature inside. Find the heat loss through a glass window that is 6 feet wide by 9 feet long when the temperature outside is 10 degrees colder than the temperature inside.

10. Kinetic energy varies jointly as the mass and the square of the velocity. A mass of 8 grams and velocity of 3 centimeters per second has a kinetic energy of 36 ergs. Find the kinetic energy for a mass of 4 grams and velocity of 6 centimeters per second.

11. The volume of a pyramid varies jointly as its height and the area of its base. A pyramid with a height of 15 feet and a base with an area of 35 square feet has a volume of 175 cubic feet. Find the height of a pyramid which has a volume of 800 cubic feet and base area of 120 square feet.