1. The number of calories that you burn varies directly with the number of minutes of cardio that a person does. If after 60 minutes a total of 525 calories are burnt, how many calories will be burnt after 40 minutes?

2. The interest earned during a given time varies jointly as the principal and the interest rate. If $1000 earned $50 at 7 percent, find the interest earned in the same time by $800 invested at 2 percent.

3. The volume of a confined mass of gas varies inversely as the pressure assuming temperature is constant. If a mass of gas has a volume of 2 liter when the pressure is 80 centimeters, what is its volume under 135 centimeters?

4. The centrifugal force at a point of a revolving body varies directly as the radius of the circle in which the point is revolving around. If the centrifugal force is 300 pounds when the radius is 6 inches, at what radius is the force 525 pounds?

5. The time for one vibration of a pendulum at a given location is directly proportional to the square root of the length of the pendulum. If the time is 2 seconds when the length is 30 inches, find the time when the length is 42 inches.

6. In cell growth the velocity of cell growth varies directly with the number of generations and inversely as the time. If the velocity was 4.12 when there were 80 generations formed in 15 minutes, find the velocity when 200 generations formed in 60 minutes.

7. The weight of a body above the surface of the earth is inversely proportional to the square of its distance from the center of the earth. If the weight is 250 pounds when the distance from the center of the earth is 5000 miles, what is the weight when the distance is 8000 miles?

8. The pressure of a gas varies jointly as the density and the absolute temperature. If the pressure is 30 pounds per square inch when the density is 0.8 and the temperature is 300° absolute, find the pressure when the density is 1.2 and the temperature is 410° absolute.

9. The volume of gas discharged from a pipe varies inversely as the square root of the length of the pipe. If 300 cubic feet of gas is discharged in 1 hour from a pipe 1500 feet long, what volume would be discharged in 1 hour from a pipe 2000 feet long?