1. Newton's law of gravitation states that the gravitational force F between two bodies of mass m_1 and m_2 respectively is given by the equation

$$F(r) = G\frac{m_1m_2}{r^2},$$

where r is the distance between the centers of mass of the bodies and G is the gravitational constant. Compute $\frac{dF}{dr}$, and explain the physical significance of its sign.

- 2. For each of the following functions, explain in words what the derivative is telling us.
 - (a) The temperature in degrees Fahrenheit is given by $F(C) = \frac{9}{5}C + 32$, where C is the temperature in degrees Celsius.
 - (b) The number D(p) of donuts that I sell is a function of their price p.
 - (c) The time R(T) that it takes to cook a 20 lb. turkey is a function of the oven temperature T.