8. (12 points) The potential energy E, in joules, of an object above the Earth's surface is a function of the distance, h, in meters, of the object from the surface of the Earth. That is, $E = f(h)$.

(a) In the context of this problem, explain the meaning of $f(20) = 1000$?

The potential energy of an object 20 meters above the Earth's surface is 1000 Joules.

(b) In the context of this problem, explain the meaning of $f'(9) = 50$?

When an object is 9 meters above the Earth's surface, increasing the height of the object one meter, the potential energy will increase by approximately 50 Joules.

(c) In the context of this problem, explain the meaning of $f^{-1}(150) = 3$?

An object with 150 Joules of potential energy is 3 meters above the surface of the Earth.

(d) In the context of this problem, explain the meaning of $(f^{-1})'(400) = \frac{1}{50}$?

When an object has 400 Joules of potential energy, its height above the surface of the Earth must be increased by approximately $\frac{1}{50}$ of a meter to increase the potential energy by 1 Joule.