The height $h(x)$, of an object is given by the function $h(x) = -16x^2 + 144x + 100$ where $x$ is time in seconds and $h(x)$ is height in feet. Find the average velocity between 1 and 2 seconds. Find the instantaneous velocity at 1 second.

$$\frac{\Delta y}{\Delta x} = \frac{h(2) - h(1)}{2 - 1} = \frac{224 - 228}{2 - 1} = \frac{-4}{1} = -4$$

$$\frac{\Delta y}{\Delta x} = \frac{h(1 + h) - h(1)}{(1 + h) - 1} = \frac{h(1 + h) - h(1)}{h}$$

$$= \frac{-16(1+h) + 144(1+h) + 100 - 228}{1+2h+h^2} = \frac{-16(1+2h+h^2) + 144(1+h) + 100 - 228}{1+2h+h^2}$$

$$\frac{112h - 16h^2}{h} = h(112 - 16h) = 112 - 16h$$

$h = 0$ and $112 - 16(0) = 112$