Optimization, II

1. Find the absolute maximum and minimum values of function $f(x) = 2x^3 - 3x^2 - 12x + 11$ on the interval $[0, 10]$. Justify your claim that the values you found are indeed the max and min values.

2. Find the *absolute minimum* value of the function $c = 0.1q + 15 + \dfrac{100}{q}$ in the interval $(0, \infty)$. Explain how you know that the value you found is the absolute minimum.

3. Consider the function $v = u^2 e^{-5u}$

a. Does v have an absolute *maximum* value in the interval $(0, \infty)$? If so, find it and justify your claim. If not, explain why not.

b. Does v have an absolute *minimum* value in the interval $(0, \infty)$? If so, find it and justify your claim. If not, explain why not.

c. Does v have an absolute *maximum* value in the interval $(-\infty, \infty)$? If so, find it and justify your claim. If not, explain why not.

d. Does v have an absolute *minimum* value in the interval $(-\infty, \infty)$? If so, find it and justify your claim. If not, explain why not.