Let $f(x) = x^a(1-x)^b$ where a and b are any two positive numbers. Use f in parts (a)-(d).

(a) If $a = 3$ and $b = 6$, find the absolute maximum value and the absolute minimum value of f on $[0, 1]$.

(b) If $a = 9$ and $b = 4$, find the absolute maximum value and the absolute minimum value of f on $[0, 1]$.

(c) If $a = \frac{2}{3}$ and $b = \frac{1}{4}$, find the absolute maximum value and the absolute minimum value of f on $[0, 1]$.

(d) If a and b are any positive numbers, find the absolute maximum and the absolute minimum value of f on $[0, 1]$. Be sure you justify your conclusions.