

5. Use **the Extreme-Value theorem** to determine the absolute maximum and minimum values of the function  $f(x, y) = x^2 + x^2y + y^2 - 2y + 2$  subject to  $y \geq x^2$  and  $y + 2x \leq 3$ .  
(19 marks)

$$\text{Ans } f(-3, 9) = 155; f(0, 1) = 1$$