Homogeneity Degree and Euler's Theorem

For the following function, verify if it is homogeneous, and if so, indicate the degree and verify Euler's theorem:

$$f(x, y) = x^2 e^{3/y^2}$$

Solution

$$f(hx, hy) = (hx)^2 e^{3/(yh)^2}$$

If the function is homogeneous, we should be able to express it as follows:

$$f(hx, hy) = h^n f(x, y)$$

with n being the degree of homogeneity. We try to solve:

$$f(hx, hy) = h^2 x^2 e^{3/(y^2 h^2)}$$

Since we cannot express the function as we mentioned before, we conclude that it is not homogeneous.