TOTAL DIFFERENTIAL APPROXIMATIONS

For each of the following functions, use the value $f(1,2)$ and the total differential to approximate $f(1.01, 2.03)$ and Δz rounded to four decimal places. Let $\Delta x = 0.01$ and $\Delta y = 0.03$. Additionally, also use your calculator to compute $f(1.01, 2.03)$ rounded to four decimal places.

1. $z = f(x, y) = x^3 y^2$

2. $z = f(x, y) = \sin(x^3 y^2)$

3. $z = f(x, y) = \sqrt{x^3 y^2}$

4. $z = f(x, y) = \sec(x^3 y^2)$

5. $z = f(x, y) = \tan(x^3 y^2)$

6. $z = f(x, y) = \sin^{-1}(x^3 y^2)$