

GRADIENT TO A LEVEL SURFACE

For each of the following functions, consider $z = f(x, y)$ as a level surface for a function $w = f(x, y) - z$ and find ∇w , the gradient.

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