

GRADIENT TO A LEVEL SURFACE

(1-6) For each of the following functions, let $w = f(x, y) - z$ 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. $z = f(x, y) = \tan(x^3 y^2)$

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

7. If $w = f(x, y, z) = \sin(xyz)$, find ∇w .

8. If $w = f(x, y, z) = x^2 + y^2 + z^2$, find ∇w .

9. If $w = f(x, y, z) = x^2 e^{yz}$, find ∇w .

10. If $w = f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$, find ∇w .