Quiz 11 (Problems)

1. Using $f(x, y) = 3x^2 + 4y^2$, $P(4, -2)$ and $Q(10, 6)$:

   a. Find the gradient of f at P.

   b. Find the directional derivative of f at P in the direction from P to Q.

   c. Find the maximum value of the directional derivative of f at P.

Quiz 11 (Answers)

1. (Math-252 Quiz 11)

   a. $\nabla f(P) = \langle 24, -16 \rangle$

   b. $\mathbf{u} = \frac{1}{\|\overrightarrow{PQ}\|}\overrightarrow{PQ}$; $D_{\mathbf{u}} f(P) = \nabla f(P) \cdot \mathbf{u} = \frac{16}{10}$

   c. $\|\nabla f(p)\| = 8\sqrt{13}$