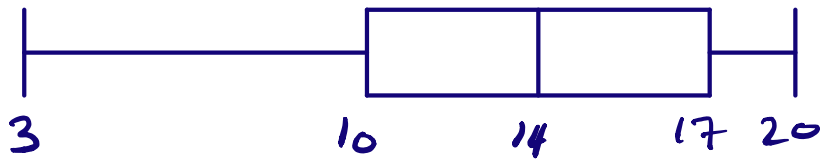


Quiz 4 results



15.5.24, 15.6 #9,

15.5.75

15.5.24 $g(x,y) = \sin(\pi(2x-y))$

$$P(-2, -2), \quad \left\langle \frac{12}{13}, \frac{5}{13} \right\rangle = \vec{v}$$

$$D_{\vec{u}} = \nabla F \cdot \vec{u} \quad (\text{unit vector } u)$$

$$\nabla g(x,y) = \langle 2\pi \cos(\pi(2x-y)), -\pi \cos(\pi(2x-y)) \rangle$$

$$\nabla g(-2, -2) = \langle 2\pi, -\pi \rangle$$

$$D_{\vec{u}}(-2, -2) = \langle 2\pi, -\pi \rangle \cdot \left\langle \frac{12}{13}, \frac{5}{13} \right\rangle$$

15.5. 75

$$f(x,y,z) = -x^2 - 4y^2 - z^2 + 9 = 0$$

Level surface of $w = f(x,y,z)$

$$\nabla f = \langle -2x, -8y, -2z \rangle$$

$$\nabla f(2, -1, -1) = \langle -4, 8, 2 \rangle = \langle -2, 4, 1 \rangle$$

eqn of tangent plane

$$\vec{n} = \nabla f$$

$$-2(x-2) + 4(y+1) + 1(z+1) = 0$$

15.6 #9

$$V = \frac{R^2}{L},$$

$$R: 3 \rightarrow 3.07$$

$$L: 51 \rightarrow 51.5$$

$$dV = \frac{\partial V}{\partial R} dR + \frac{\partial V}{\partial L} dL$$

$$= \frac{2R}{L} dR - \frac{R^2}{L^2} dL$$

$$dV = \left(\frac{6}{51}\right)(.07) - \left(\frac{9}{51^2}\right)(.5)$$