

1.  $\frac{\langle 2, -1, -3 \rangle}{\sqrt{14}}$
2. (a)  $4x + 3y - 7 = 0$   
(b)  $|A - B| = 5$
3. (a)  $|r'(t)| = 3e^t$  so that

$$\int_0^{2\pi} 3e^u du = 3e^{2\pi} - 3$$

- (b)  $\mathbf{T}(0) = \frac{\langle 2, 2, 1 \rangle}{3}$
4. (a)  $\{(x, y) : x \neq 0 \neq y\}$   
(b) Along the  $y$ -axis,  $f \rightarrow 0$ , but along the  $x$ -axis,  $f \rightarrow 1$ .
5.  $f_{xx}(x, y) = 2 \sin 3y$ ,  $f_{xy}(xy) = 6x \cos 3y$ ,  $f_{yx}(x, y) = 6x \cos 3y$  (notice that  $f_{xy} = f_{yx}$  in this case) and  $-9y^2 \cos 3y$
6. Not covered