

Quiz 1      Calculus 3      10/30/19

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. A really scary ghost flies along a line segment from  $(3, -4, 6)$  to  $(1, -3, 8)$ . Give equations  $x(t)$ ,  $y(t)$ ,  $z(t)$ , and bounds for  $t$  to parametrize this path.

$$\begin{aligned} x(t) &= 3 + (-2)t \\ y(t) &= -4 + t \\ z(t) &= 6 + 2t \end{aligned} \quad , \quad 0 \leq t \leq 1$$



Excellent!

$$\begin{aligned} 3 \rightarrow 1 &= (-2) \\ -4 \rightarrow -3 &= (+1) \\ 6 \rightarrow 8 &= (+2) \end{aligned}$$

$$\begin{aligned} x(0) &= 3 & x(1) &= 1 & \checkmark \\ y(0) &= -4 & y(1) &= -3 & \checkmark \\ z(0) &= 6 & z(1) &= 8 & \checkmark \end{aligned}$$

2. A wicked little goblin is running in circles around you gibbering curses. You're at the origin and the goblin's path is a circle with radius 4 feet, which is really frustrating because it puts him just out of reach. Also, you're having a nightmare. Give parametric equations  $x(t)$ ,  $y(t)$ , and bounds for  $t$  that produce 13 times around the goblin's path.

$$\begin{aligned} x(t) &= 4 \cos t \\ y(t) &= 4 \sin t \end{aligned} \quad , \quad 0 \leq t \leq 26\pi$$

Wonderful!  
(Awful!)  
 $13 \cdot 2 = 26$

