Quiz 1

Be sure to follow the quiz instructions in order to avoid a deduction in points. Submissions are due in Gradescope by 11:59pm on Friday; no late work is accepted.

Name:

Question #1: Find the area of the parallelogram determined by the points by using the cross product.

$$P(1,2,3),\ Q(2,4,5),\ R(3,0,1)$$

Question #2: Let P be the plane defined by $x+2y+z=7$. Find (a) the vector equation for the line ℓ passing through the point $Q(1,1,1)$ which is orthogonal to P, and (b) find the intersection between this line ℓ and the plane P.

Question #3: Suppose a particle is traveling and it's location at time t, $0 \leq t \leq 2\pi$, is given by the parametrization $\mathbf{r}(t) = \langle \sin(3t), \cos(3t), t \rangle$, with t measured in seconds and $\mathbf{r}(t)$ in meters.

(a) Find the speed of the particle one quarter of the way through it's journey, at time $t = \pi/2$.

(b) Find a unit vector which points in the direction of travel at time $t = \pi/2$.

(c) Find the position of the particle halfway through the journey, at time $t = \pi$.