Full name: *Key*   GT ID:_____ Sec:_____

Quiz 1 Version A

You have 15 minutes to take the quiz. No phones, notes, or use aids of any kind is permitted.

1. (2 points) Choose whether the following statement is true or false. If the statement is *always* true, pick true. If the statement is *ever* false, pick false. [A]

   For all vectors $\mathbf{v}, \mathbf{w} \in \mathbb{R}^3$ we have $\mathbf{v} \times \mathbf{w} = -(\mathbf{w} \times \mathbf{v})$.

   ● **TRUE**   ○ **FALSE**

   $$\begin{vmatrix} \hat{\imath} & \hat{\jmath} & \hat{k} \\ v_1 & v_2 & v_3 \\ w_1 & w_2 & w_3 \end{vmatrix} = - \begin{vmatrix} \hat{\imath} & \hat{\jmath} & \hat{k} \\ w_1 & w_2 & w_3 \\ v_1 & v_2 & v_3 \end{vmatrix}$$

2. (8 points) [**Lines and Planes**]
   (a) Find a normal vector $\mathbf{n}$ to the plane defined by $3x + y + z = 7$. [AN]

   (b) Find the equation for the plane which passes through the point $P(1, -1, 3)$ and is parallel to the plane $3x + y + z = 7$. [AJN]

   Show all your work and state any formulas you are using for [J] credit, an answer which is just the plane equation will not receive full [J] credit.

(a) $\boxed{\vec{n} = \langle 3, 1, 1 \rangle}$

(b) $P(1, -1, 3)$ w/ normal vector $\vec{n} = \langle 3, 1, 1 \rangle$ So

$$3x + y + z = D$$

and passing through $(1, -1, 3)$ So

$$3(1) + (-1) + (3) = D$$

$$\Rightarrow D = 5$$

So equation is $\boxed{3x + y + z = 5}$