Closing Tue, Jan. 20: 12.5(1)(2)(3)
Closing Thu, Jan. 22: 12.6
Note: No class Monday. No MSC Sunday or Monday. So get your last minute 12.5 questions answered today!

12.5 Lines/Planes in 3 Dimensions

Lines: $x = x_0 + at$, $y = y_0 + bt$, $z = z_0 + ct$

$\boldsymbol{v} = \langle a, b, c \rangle$ = direction vector

$\boldsymbol{r_0} = \langle x_0, y_0, z_0 \rangle$ = a position vector

Planes: $a(x - x_0) + b(y - y_0) + c(z - z_0) = 0$

$\boldsymbol{n} = \langle a, b, c \rangle$ = a **normal** vector.

$\boldsymbol{r_0} = \langle x_0, y_0, z_0 \rangle$ = a position vector

To find equations for a line

Info given?	Find two points	
Done.	$\vec{v} = \overrightarrow{AB}$ (subtract components)	$\overrightarrow{r_0} = \vec{A}$

To find the equation for a plane

Info given?	Find three points	
Done.	Two vectors parallel to the plane: $\overrightarrow{AB}$ and $\overrightarrow{AC}$	
	$\vec{n} = \overrightarrow{AB} \times \overrightarrow{AC}$	$\overrightarrow{r_0} = \vec{A}$