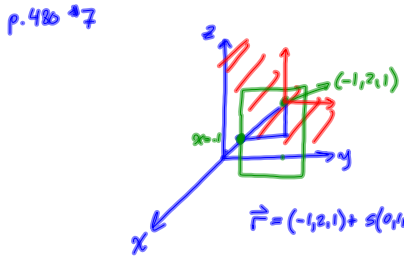
Review

Read Ch 8 Summary p.479

Review p.480-483 (34 questions)

Chapter 9.1 (Intersections of L & L/ L & Plane)

p.480 #7



$\vec{r} = (-1,2,1) + s(0,1,0) + t(0,0,1)$

$Ax + By + Cz + D = 0$

$x + D = 0$

$D = 1 \quad \therefore x + 1 = 0 \quad \boxed{x = -1}$

$x = -1$
$y = 2 + s$
$z = 1 + t$

$\vec{r} = (x_1, y_1, z_1) + t(\_\_\_)$

x
y
z

#11

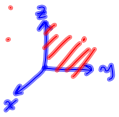
$\pi: 3x + 2y - z + 6 = 0$

$\vec{n} = (3,2,-1)$

A(0,1,8) C(0,4,6)
B(1,1,11)

$\vec{r} = (0,1,6) + s(1,1,3) + t(-1,-1,-5)$

$\begin{bmatrix} 0 & 3 & 1 & 0 \\ -1 & -5 & -1 & -1 \end{bmatrix}$



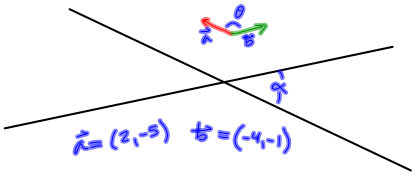
CHECK:

$\vec{BC} \times \vec{AC} = \begin{vmatrix} i & j & k \\ 1 & 0 & 3 \\ -1 & -1 & -5 \end{vmatrix}$

$= (3,2,-1)$

p.444 #10

$\vec{a} \cdot \vec{b} = |\vec{a}||\vec{b}|\cos\theta$



$\vec{a} = (2,-5) \quad \vec{b} = (-4,-1)$

$\cos\theta = \dfrac{\vec{a} \cdot \vec{b}}{|\vec{a}||\vec{b}|}$

$|\vec{a}| = \sqrt{29}$

$|\vec{b}| = \sqrt{17}$

$= \dfrac{(2,-5) \cdot (-4,-1)}{\sqrt{29}\sqrt{17}}$

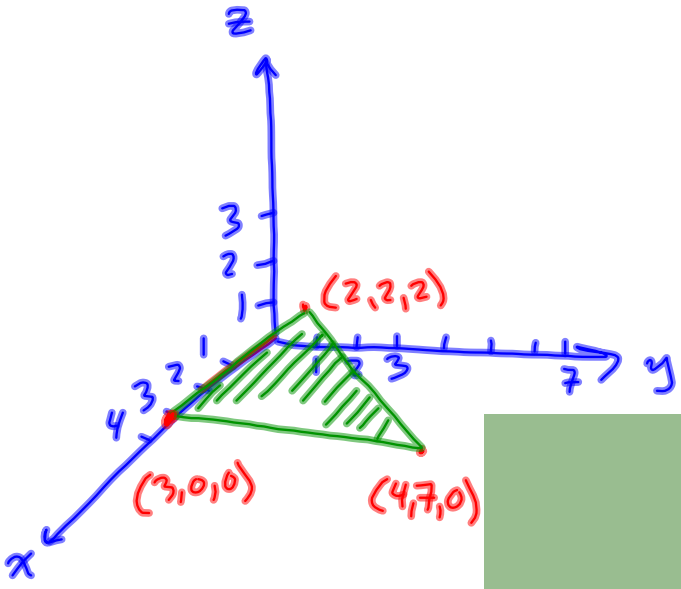
$\theta = \cos^{-1}\left(\dfrac{-8+5}{\sqrt{29}\sqrt{17}}\right)$

$\theta \doteq 97^\circ$

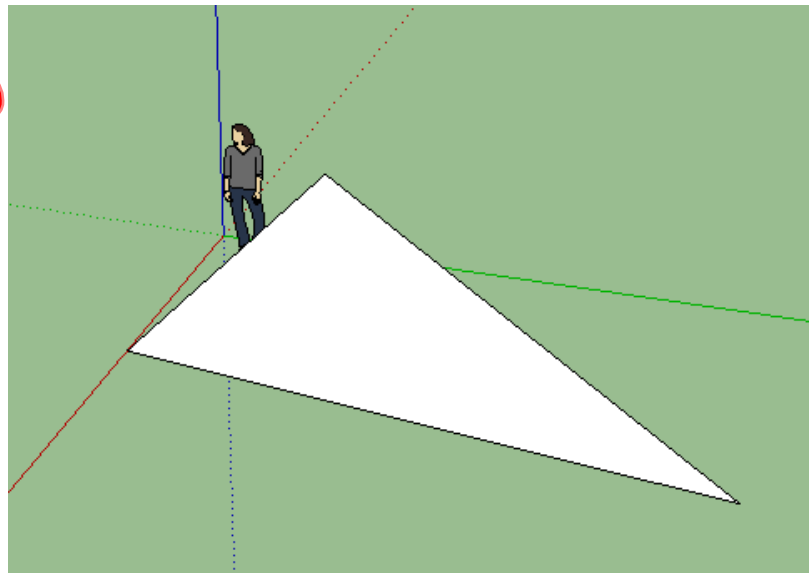
ACUTE

get α

$\alpha = 180 - 97^\circ \doteq 83^\circ$



http://google-sketchup.en.softonic.com/



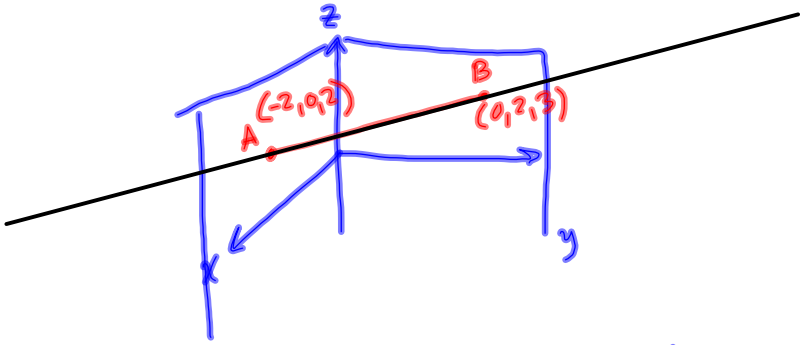
p. 478
#13

$\vec{r} = (-8,-6,-1) + s(2,2,1)$, $s \in \mathbb{R}$

$x = -8 + 2s$
$y = -6 + 2s$
$z = -1 + s$

A
π: xz-plane
$y = 0$

B
π yz-plane
$x = 0$



Solve for pt A:
$-6 + 2s = 0$
$s = 3$

Solve for pt B:
$-8 + 2s = 0$
$s = 4$

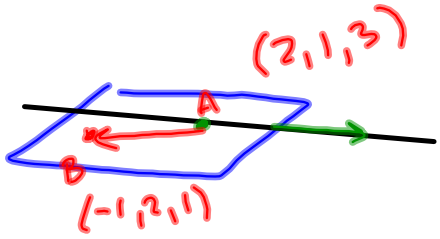
get A by subbing in $s = 3$
$\vec{r} = (-8,-6,-1) + s(2,2,1)$
$= (-8,-6,-1) + (6,6,3)$
$= (-2, 0, 2)$

$\vec{r} = (-8,-6,-1) + 4(2,2,1)$
$= (0, 2, 3)$

Find $|\vec{AB}| = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2 + (z_2-z_1)^2}$
$= \sqrt{(2)^2 + (2)^2 + (1)^2}$
$= \sqrt{9}$
$= 3$

∴ the distance is 3 units.

p. 460
#10



π: $\vec{r} = (-1,2,1) + s(4,1,5) + t(-3,1,-2)$

$\vec{AB} = (-3,1,-2)$

//

p. 468 #10 ← Solution manual is wrong.