$$\kappa = \frac{|\bar{T}'(t)|}{|\bar{r}'(t)|} = \frac{|\bar{r}'(t) \times \bar{r}''(t)|}{|\bar{r}'(t)|^3}$$

$\bar{r}$ given

Better when
$|\bar{r}'(t)| = \text{constant}.$

$\langle t^2 \sin(2t), t, 73t^2 - 5 \rangle$

$\langle \ln(t), \cos(7t), 25t^3 \rangle$

Recognize when the curve lives in one of our basic 3-D shapes.

$\cos^2 t + \sin^2 t = 1$

$\langle \cos t, \sin t, t \rangle$

$\bar{r}(t) = \langle \cos t, t, \sin t \rangle$

$\bar{r}'(t) = \langle -\sin t, 1, \cos t \rangle$

$\Rightarrow |\bar{r}'(t)| = \sqrt{2}$

Line shared by 2 planes

$ax+by+cz=d$

$ex+fy+gz=h$

$\mathcal{S}$ $\bar{u}\cdot(\bar{v}\times\bar{w})=2.$

what's...

$(\bar{u}\times\bar{v})\cdot\bar{w} = 2$ T 13.4.8

Let $A(1,0,1)$, $B(2,3,0)$, $C(-1,1,4)$, $D(0,3,2)$

Plane containin' A, B, & C

Area of $\triangle ABC$

Area of parallelogram defined by $\overrightarrow{AB}$ & $\overrightarrow{AD}$

Volume of parallelepiped with adjacent edges $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AD}$

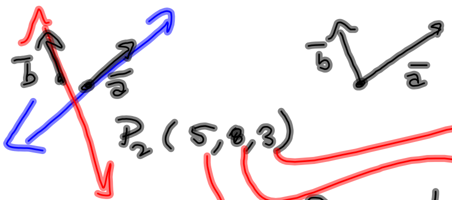
Distance from D to plane containing A, B, C

Distance between

$P_1(2,1,0)$ $\mathcal{L}_1$: $x=2+t$, $y=1+3t$, $z=t$ $\bar{a}=\langle 1,3,1\rangle$

$\mathcal{L}_2$: $x=5$, $y=8-8t$, $z=3-4t$ $\bar{b}=\langle 0,-8,-4\rangle$

$\bar{a}\times\bar{b} = \bar{n}$ to both $\bar{a}\times\bar{b}=\bar{c}$



$\bar{a}\times\bar{b}$ is $\perp$ to $\mathcal{L}_1$ & $\mathcal{L}_2$?

$P_2(5,8,3)$

2,1,0)

Does the plane

$\left|-1(x-2)+(y-1)-2(z-0)\right|=0$

$\sqrt{1^2+1^2+2^2}$

contain $\mathcal{L}_1$?

$-1(x-5)+(y-8)-2(z-3)=0$

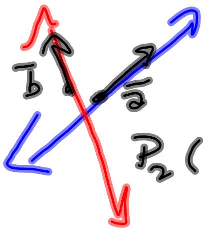
contain $\mathcal{L}_2$?

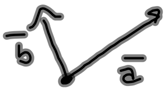
$$\begin{array}{r} \langle 1,\ 3,\ 1\rangle \\ \times\ \langle 0,-8,-4\rangle \\ \hline \langle -4,4,-8\rangle \end{array}$$

OR $\langle -1,1,-2\rangle$ yeah.

Double-check it 2 B sure.

a find distance from ~~the~~ plane to a point on the other plane.





$\bar{a} \times \bar{b}$ is $\perp$ to L_1 & L_2?

$P_2(5,8,3)$

2,1,0)

$\langle 1, 3, 1 \rangle$

$\times \langle 0, -8, -4 \rangle$

$\langle -4, 4, -8 \rangle$

OR $\langle -1, 1, -2 \rangle$ yeah.

Double-check it 2 B sure.

a

Does the plane

$-1(x-2)+(y-1)-2(z-0)=0$

contain L_1? $\sqrt{1^2+1^2+2^2}$

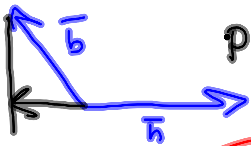
$-1(x-5)+(y-8)-2(z-3)=0$

contain L_2?

find distance from ~~the~~ plane to a point on the other plane.

$\bar{a} \cdot \bar{b}$

$\bar{a} \times \bar{b}$



$proj_{\bar{n}} \bar{b} = \bar{c}$

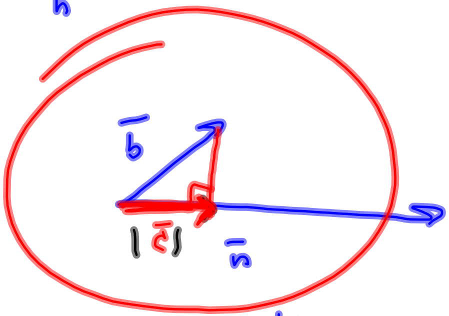
$= |\bar{c}|$

$|\bar{a} \times \bar{b}| = |\bar{a}||\bar{b}| \sin\theta$

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

$$\boxed{|\bar{c}| = |\bar{b}||\cos\theta|}$$

$$\boxed{\frac{|\bar{c}|}{|\bar{b}|} = |\cos\theta| = \frac{|\bar{b} \cdot \bar{n}|}{|\bar{b}||\bar{n}|}}$$



Want $|\bar{c}|$ times a unit vector in the direction of $\bar{n}$

unit vector times that length

$$|\bar{c}| = |\bar{b}| \cos\theta = \frac{|\bar{b} \cdot \bar{n}|}{|\bar{n}|}$$

Now, vector with $|\bar{c}|$'s length in the proper direction:

$$proj_{\bar{n}} \bar{b} = \frac{|\bar{b} \cdot \bar{n}|}{|\bar{n}|} \cdot \frac{\bar{n}}{|\bar{n}|} = \frac{|\bar{b} \cdot \bar{n}|}{|\bar{n}|^2} \bar{n}$$