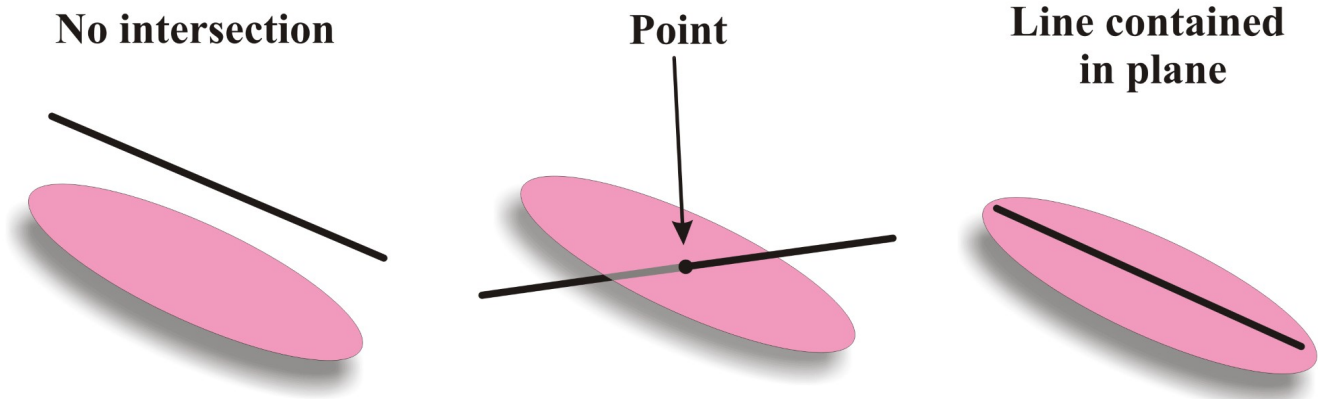


7.1 Intersection of a Line with a Plane
Intersection of Two Lines

Intersection of a line and a plane:



Ex. 1 Determine the point of intersection of the line and plane.

a) l: $x=3+4t$ $\pi: x - y - 2z = 0$
 $y=2+3t$
 $z=-1+2t$

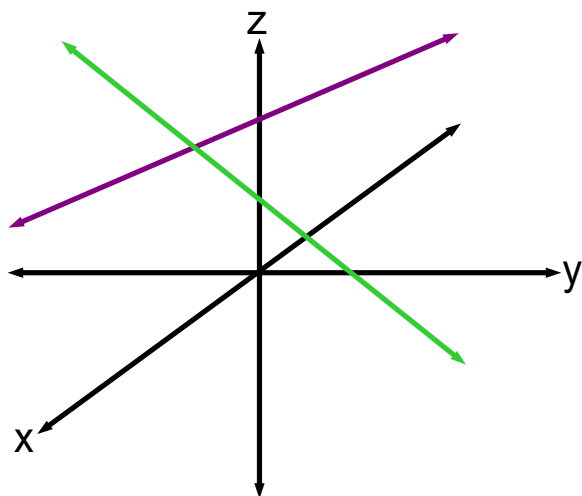
b) l: $\vec{r} = (2, -5, 6) + t(3, 1, 8)$ $\pi: 5x + y - 2z + 2 = 0$

c) l: $x = 2 + t$ $\pi: 3x + 19y - 7z - 8 = 0$
 $y = -1 - 2t$
 $z = -3 - 5t$

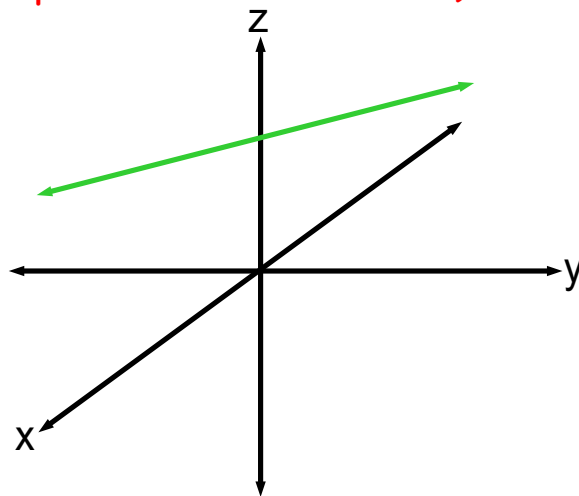
Intersection of Two Lines:

A: Intersecting Lines

Intersect at One Point

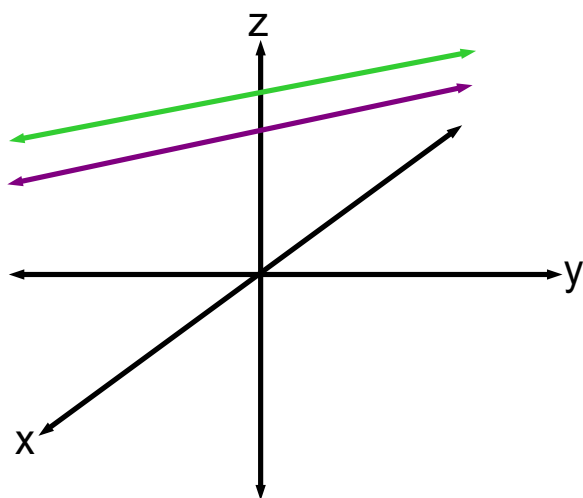


Coincident Lines (all points on line are points of intersection)

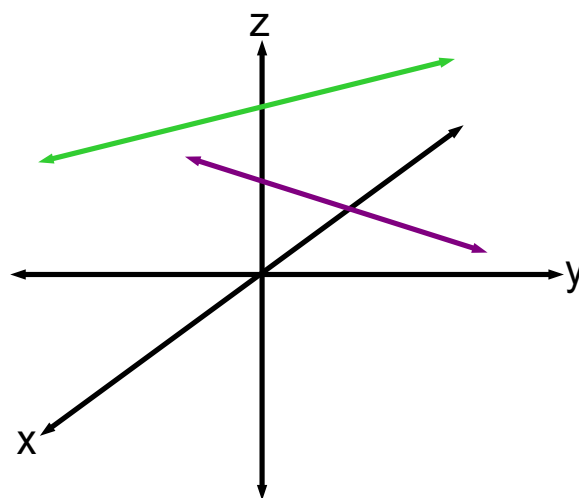


B: Non-Intersecting Lines

Parallel Lines



Skew Lines



Ex. 2 Determine the point of intersection of the two lines.

$$\begin{aligned}l_1: \quad x &= -5 + 3s \\ y &= 2 + 2s \\ z &= -7 + 6s\end{aligned}$$

$$\begin{aligned}l_2: \quad x &= t \\ y &= -6 - 5t \\ z &= -3 - t\end{aligned}$$

b) $l_1: \vec{OP} = (-2, 1, 0) + s(1, 3, 7)$ $l_2: \vec{r} = (3, -3, 4) + t(5, -4, -2)$

c) $l_1:$

$$\begin{aligned}x &= 3 + 2t \\y &= -1 - 3t \\z &= 1 + t\end{aligned}$$

$$l_2: r = (1, -1, 3) + s(-4, 6, -2)$$

Homework

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#4a,5ab,6-10(not7b),12,13,15

