

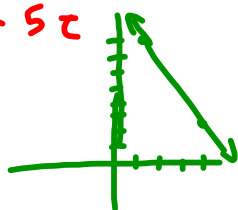
8.6 Parametric equations

If we know the coordinates of a pt. on a line & its direction vector, we can write its parametric equations.

Ex Find the parametric equations of a line // to $\vec{v} = \langle 3, -5 \rangle$ & passing through the point at $(4, 3)$.

$$\begin{aligned} x &= x_1 + ta_1 & P_1 &= (x_1, y_1) \\ y &= y_1 + ta_2 & \vec{a} &= \langle a_1, a_2 \rangle \end{aligned}$$

$$\begin{aligned} x &= 4 + 3t \\ y &= 3 - 5t \end{aligned}$$



t	x	y
-1	1	8
0	4	3
1	7	-2
2	10	-7

\uparrow $4+3(2)$ \uparrow $3-5(2)$

Slope-int. form from param. equations.

Ex
$$\begin{aligned} x &= -2 + t \\ y &= 4 - 3t \end{aligned}$$

* Solve for t *

$$t = x + 2$$

$$y = 4 - 3t$$

$$\begin{aligned} y - 4 &= -3t \\ -3 &= -3 \frac{-3}{-3} \end{aligned}$$

$$t = -\frac{1}{3}y + \frac{4}{3}$$

$$(x + 2 = -\frac{1}{3}y + \frac{4}{3}) \cdot 3$$

$$3x + 6 = -y + 4$$

$$-y = 3x + 2$$

$$y = -3x - 2$$