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Linear Algebra 1

Homework 3

1a. $x = 1 + t$

$y = 20 + 20t$

b. $y = -3x$

$D = \begin{bmatrix} 1 \\ 4 & -3 \end{bmatrix} = \begin{bmatrix} 1 & -0 \\ -3 & -0 \end{bmatrix}$

$x = 1 \cdot t + 0 = \underline{1t}$

$y = -3t + 0 = \underline{-3t}$

$y_0 = -3 \cdot 0 \quad \text{if } x = 0$

$y_1 = -3 \cdot 1 \quad \text{if } x_1 = 1$

$y_0 = 0 \quad x_0 = 0$

$y_1 = -3 \quad x_1 = 1$

e. $y = 0$

$D = \begin{bmatrix} 0 \\ 0 \end{bmatrix} \quad \begin{matrix} x = 0 \\ y = 0 \end{matrix} \quad \text{or} \quad D \begin{bmatrix} a \\ 0 \end{bmatrix} \quad \begin{matrix} x = at \\ y = 0 \end{matrix}$ since there is no number for x it can be any number as long y is 0

since this is a point

2a. $(2t, t) = |(2t, t)|$

$= \sqrt{(2t)^2 + t^2} \quad | \cdot \sqrt{5}\sqrt{t^2}$

$= \sqrt{5} \sqrt{t^2}$

3 b. $d = (2 - 0, 7 - 0, 6 - 0)$

$d = (2, 7, 6)$

$x = 0 + 2t$
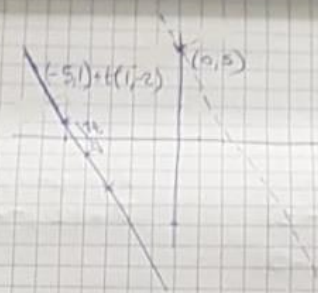
$y = 0 + 7t$

$z = 0 + 6t$

4 b.

$(0,5)+t(1,-2)$

$d=(1-0, 3-5)$

$d=(1,-2)$

$m=\frac{3-5}{1-0}=\frac{-2}{1}$

$b=(0,5)$

$y=\frac{-2}{1}x+5$

5 a.

$(-1,0,2)+t(0,-2,1)$

c.

$(3,7,0)+t(1,0,0)$

$x = \vec{v}=(1,0,0)$

e. $(9,3,2)+t(0,1,0)$

g. $(0,0,0)+t(0,1,0)$

6 a.

s=0	=(1,3,5)	t=0	=(4,6,7)	
s=1	=(8,4,2)	t=1	=(3,6,9)	
s=2	=(15,5,-1)	t=2	=(2,6,11)	
	(22,6,-4)		→ parael to y-axis	

lets see if x-axis is same?

s=0 t=3 does not meet, so too by any number of x

by y-axis= since t is parael to y-axis so when s is by 6 on y-axis (22,6,-4). And t=-18 so that (22,6,-29) z-axis is not the same

must be that both lines never meet together and not parael or identical etc.

7b. $P_1 (1, 0, 1)$ $\vec{v} = (3-1, -4-0, -3-1)$
$P_2 (3, -4, -3)$ $\vec{v} = (2, -4, -4)$ = vector of P_1 and P_2
$P_3 (4, -6, -5)$

$P_3 \text{ if } = (1, 0, 1) + v(2, -4, -4) = 4, -6, -5$

$v \cdot 1, 5$

$so = (1, 0, 1) + 1.5(2, -4, -4) = 4, -6, -5$

yes, it's in one same line

11a. $(1, 2, 3) + t(0, -1, -2) = 1, 1, a$

$2 + (-1)t = 1$
$= 2 - t = 1$
$t = 1$

$(1, 2, 3) + (0, -1, -2) = 1, 1, 1$

13 8. $P_1 = (-2, 0, 1)$
$P_2 = (0, 2, 3)$ $= -4x + 10y + (-6)z + (-2) = 0$
$P_3 = (1, 0, -1)$