Wehelp Assignment week 1 - 邱宇軒

Task 1. If 2 non zero vectors fullfill $x = ty$, then these 2 vectors are parellel

1-1 $(-2,1,3) - 3(4,6,1) = (-14,-17,0) \Rightarrow$ not parellel

1-2 $(-3,-6) + 3(1,2) = (0,0) \Rightarrow$ parellel

1-3 $(3,0,2,-5) - 3(1,-2,0,1) = (0,-6,2,2) \Rightarrow$ not parellel

1-4 $(10,0,2,-4,-8) - 2(5,0,1,-2,-4) = (0,0,0,0,0) \Rightarrow$ parellel

Task 2. the equation of plane containing 3 point (A,B,C) is $x = A + s(B-A) + t(C-A)$

if these 3 points are not collinear (all parellel)

2-1. $x = (2,-5,-1) + s(0-2, 4-(-5), 6-(-1)) + t(-3-2, 7-(-5), 1-(-1))$

$\Rightarrow x = (2,-5,-1) + s(-2,9,7) + t(-5,12,2)$

2-2. these 3 point don't define a plane.

(1) $(2,4,2) - 2(1,2,1) = (0,0,0)$

(2) $(-3,-6,-3) + 3(1,2,1) = (0,0,0) \Rightarrow$ all parellel

(3) $3(2,4,2) + 2(-3,-6,-3) = (0,0,0)$

2-3. $x = (1,1,1) + s(2-1, 5-1, 2-1) + t(0-1, 0-1, 0-1)$

$\Rightarrow x = (1,1,1) + s(1,4,1) + t(-1,-1,-1)$

$\Rightarrow x = s(1,4,1) + t(-1,-1,-1)$

Task 3.

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

3-2. if N is the field of natural number, which means P(N) can't contain the coefficient like 0.5 (not natural number), so f doesn't belong to P(N)

Task 4.

4-1. False, if $f(x) = x + 1 \Rightarrow$ degree 1

$g(x) = -x + 100 \Rightarrow$ degree 1

$f(x) + g(x) = x + 1 + (-x) + 100 = 101 \Rightarrow$ degree 0

4-2. True

4-3. False, if $x = (1,1), y = (1,0), a = 0$

$\Rightarrow ax = ay = (0,0)$, but $x \neq y$