$$y = 5x^2 - 2x^1 + 3x^0 \Longrightarrow y = 3 - 2x + 5x^2$$

$$y = 1^{(1)} + 1x + \frac{1}{2}x^2 + \frac{1}{6}x^3 + \frac{1}{24}x^4 + \ldots \text{"="} e^x$$

$$\vec{v} = 3\vec{i} + 2\vec{j} - 4\vec{k}$$

$$1\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = \sin 5x$$

* linear combinations
* linear transformations (operators, transforms)
  - $\frac{d}{dx}$ $\qquad \frac{d}{dx}\left(f(x) \pm g(x)\right) = \frac{df}{dx} \pm \frac{dg}{dx}$
  - $A(\vec{u}+\vec{v}) = A\vec{u} + A\vec{v}$ $\qquad \frac{d}{dx}\left[(cf)(x)\right] = c\,\frac{df}{dx}$

$(cA)(\vec{u}) = c(A\vec{u})$

- $\int (f+g)\,dx = \int f\,dx + \int g\,dx$

- $\underbrace{\left(\frac{d^2}{dx^2} - 3\frac{d}{dx} + 2\right)}_{\text{linear transformation}}(y) = \frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y$

- $\mathcal{L}[f(t)] = \int_0^\infty f(t)e^{-st}\,dt = F(s)$

Laplace transform

$$(a+b)^2 \neq a^2 + b^2$$

$$\sin(u+v) \neq \sin u + \sin v$$

$$\sqrt{a+b} \neq \sqrt{a} + \sqrt{b}$$

$\begin{bmatrix} a \\ 1 \\ b \end{bmatrix}$ not a subspace doesn't contain $\vec{0}$

$\begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ $\begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix}$

$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$

Turn in Wed:

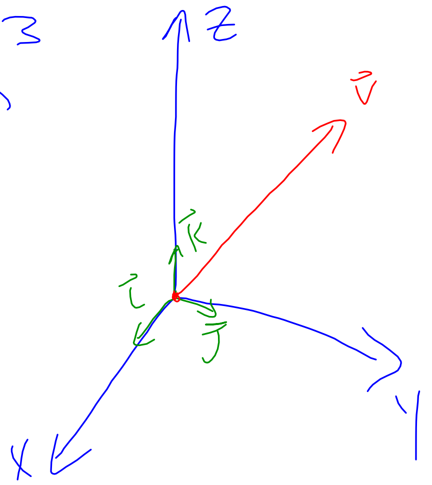
1.2: 1, 2, 6

1.3: 6, 7, 12, 13 if not, give specific counterexample

if yes, provide an argument as to why.

Vector space $\longrightarrow$ subspace

$\mathbb{R}^3$



1.3: 1a, b, c, 3, 4, 5