



2.2: || a) $\text{rank}(T)=3$, T is onto because $\text{rank}(T)=\dim(W)$
 T is not one-to-one because $\text{nullity}(T) > 0$

b) $\text{nullity}(T) = 1$ $\dim(W) \geq 4$

Since we don't know $\dim(W)$, we don't know if T is onto. T is not one-to-one, because $\text{nullity}(T) \neq 0$.

$$\begin{aligned} & D(ax^2+bx+c) \\ &= 2ax + (3)(ax^2+bx+c) + b \\ &= 3a(x^2) + (2a+3b)x + (b+c) = 0 \end{aligned}$$

$a=0$
 $b=0$
 $c=0$

$$7x^2 - 5x + 3$$

$\ker(D) = 0$

2.2: 9 Give kernel & range using set builder notation

Give a basis for each,
rank & nullity

$$\ker(T) = \{ \quad \}$$

2.2: 12, 13

2.1: 19, 20