Chapter 3 線性變換
Linear transformation

3-1 基底變換 (Change of basis)

1) 在 R^2 中的變換
2) 由 標準基底 到 任意基底
3) 任意二組基底的互換

3-2 線性變換 (Linear transformation)

1)不同維度空間的變換

Mapping a vector space from R^n to R^m

2) A vector function L is a linear transformation if

--- You can scale first and then transform or transform first and then scale.

$$L(\alpha x) = \alpha L(x)$$

--- You can transform first and then sum or sum first and then transform.

$$L(x + y) = L(x) + L(y)$$

3-2 線性變換 (Linear transformation)

1) 不同維度空間的變換

Ex 1) 放大 3 倍 (scaling)

Ex 2) 剪力變換 (shear transformation)

Ex 3) 投影 (projection)

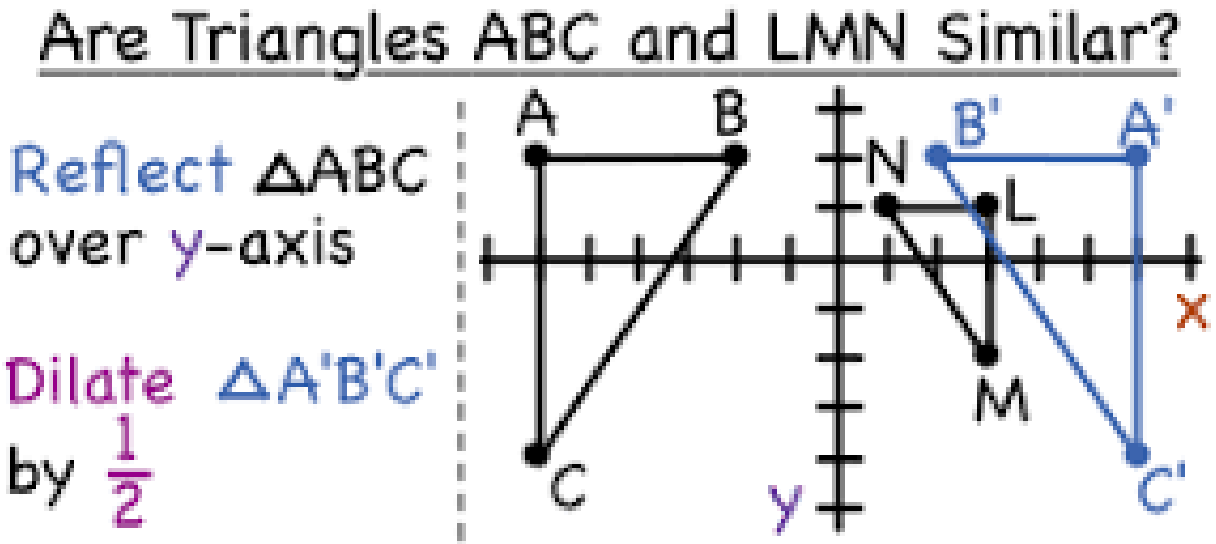
Ex 4) 鏡射 (reflection)

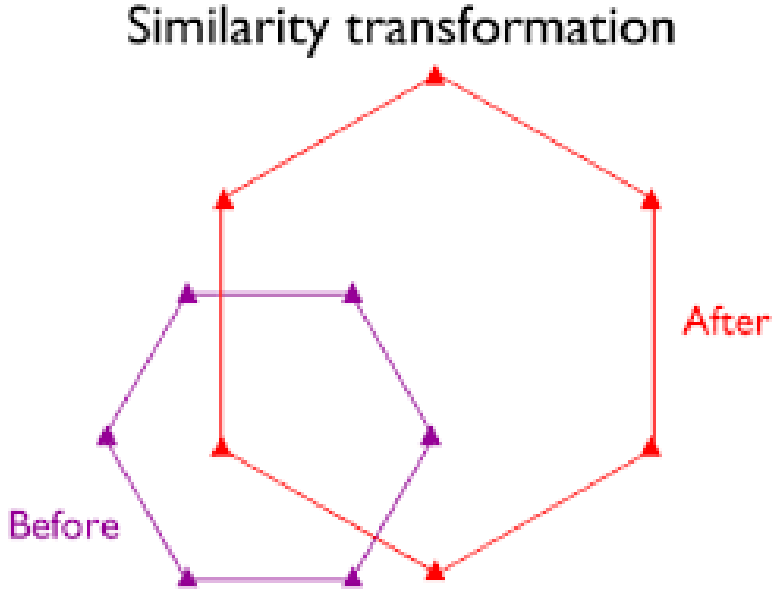
Ex 5) 旋轉 90 度 (rotation)

Ex 5') 旋轉 θ 度 (rotation)

*3-3 相似變換 (Similar transformation)

$AS = SB, B = S^{-1}AS$, and $A = SBS^{-1}$



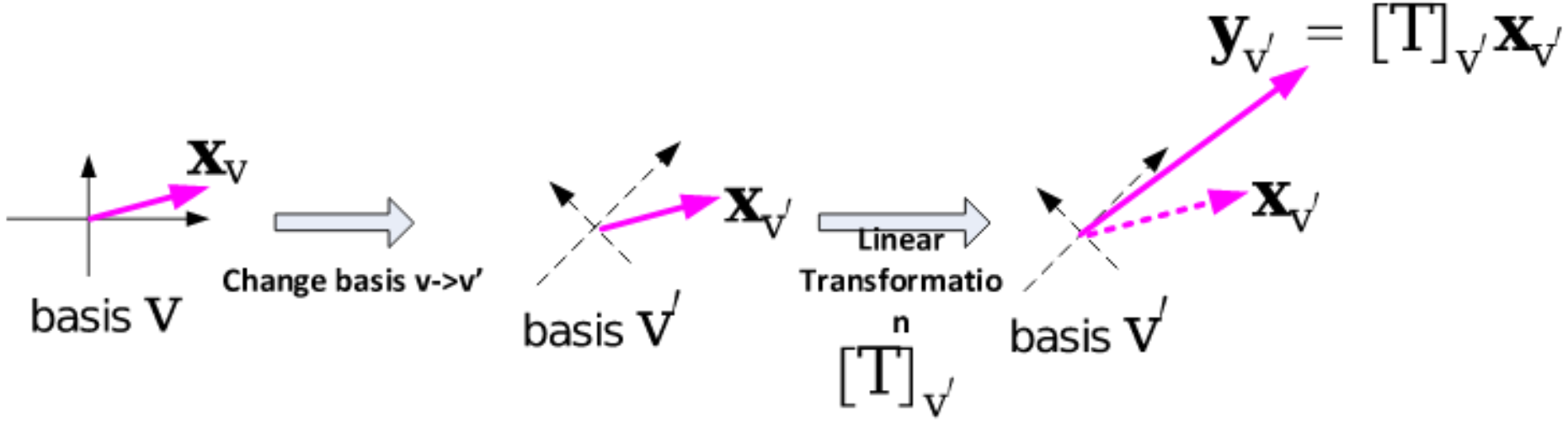


* 課程後半週數再討論

*3-3 相似變換 (Similar transformation)

1) 相似變換 = 線性變換 + 基底變換

$$AS = SB, \boldsymbol{B = S^{-1}AS}, \text{ and } \boldsymbol{A = SBS^{-1}}$$



Combining change of basis and linear transformation

* 課程後半週數再討論