

- 1) $y = \sin X$ جتا ، $y' = \cos X$
- 2) $y = \cos X$ جتا ، $y' = -\sin X$
- 3) $y = \tan X$ طتا ، $y' = \sec^2 X$
- 4) $y = \sec X$ قتا ، $y' = \sec X \cdot \tan X$
- 5) $y = \cot X$ قتا ، $y' = -\csc^2 X$
- 6) $y = \csc X$ قتا ، $y' = -\csc X \cdot \cot X$

بعض المتطابقات المثلثية

- 1) $\sec X = \frac{1}{\cos X}$
- 2) $\csc X = \frac{1}{\sin X}$
- 3) $\cot X = \frac{1}{\tan X}$
- 4) $\sin^2 X + \cos^2 X = 1$
- 5) $\sec^2 X = 1 + \tan^2 X$
- 6) $\csc^2 X = 1 + \cot^2 X$
- 7) ~~tan X~~ $\tan X = \frac{\sin X}{\cos X}$

Ex.

- 1) $y = \sin(3X^2 + 2X + 1)$
 $y' = (6X + 2) \cdot \cos(3X^2 + 2X + 1)$
- 2) $y = 3 \sin(3X + 5)$
 $y' = 3 \cos(3X + 5) \cdot 3$
 $= 9 \cos(3X + 5)$
- 3) $y = \sin(\pi - X)$
 $y' = -\cos(\pi - X)$
- 4) $y = \sin\left(\frac{\pi}{2} - X\right)$
 $y' = -\cos\left(\frac{\pi}{2} - X\right)$
- 5) $y = (\sin X)^3$
 $y' = 3(\sin X)^2 \cdot (\cos X)$
 $= 3 \cos X \cdot \sin^2 X$

$$6) y = \sin^3(2x^2 + 3x + 5)$$

$$y = [\sin(2x^2 + 3x + 5)]^3$$

$$y' = 3[\sin(2x^2 + 3x + 5)]^2 \cdot \cos(2x^2 + 3x + 5) \cdot (4x + 3)$$

$$= 3(4x + 3) \cdot \cos(2x^2 + 3x + 5) \cdot \sin(2x^2 + 3x + 5)^2$$

Ex-

$$1: y = \frac{\sin(2x^2 + 1)}{(\sin x \cos^2 x + 2x^2)}$$

$$2: y = \cos[\sin(x^2 - x + 1)] + \sin(\cos x^2)$$

$$3: x \cdot \sin y + y \cdot \sin x + x^2 + y^2 = 10$$

$$4: y = \sin(x + 1)$$

$$5: y = \sin \frac{x}{2}$$

$$6: y = \sin(3x + 4)$$

$$7: y = x - \sin x + \cos y$$

$$8: y = \sec(1 - x)$$

$$9: y = \frac{\sin x}{\cos x}$$

$$10: y = \frac{1}{\cos x}$$

$$11: y = \frac{1}{\sin x}$$

$$12: y = \cot^2 x$$

$$13: y = \sqrt{2 + \cos 2x}$$

$$14: y = \sec^2 x - \tan^2 x$$

$$15: x = \tan y$$

$$16: x = \sin y$$

$$17: y^2 = \sin^4 2x + \cos^4 2x$$

$$19: x + \sin y = xy$$

$$20: x = \cos^2 t, y = \sin^2 t \quad [\text{Chain Rule}]$$

$$21: x = \cos^3 t, y = \sin^3 t \quad [\text{ " } =]$$

$$22: x = \tan^2 t, y = \sin 2t \quad [\text{ " } \text{ " }]$$

$$23: y = \sec(x + 2)$$

$$24: y = \frac{\cos(x^2 + 1)}{\sin(x - 2) + 3x^2}$$