

①

(i)  $y = 5x^4 + 50x^2 + 30x - 19$

$$\frac{dy}{dx} = 20x^3 + 100x + 3$$

(ii)  $y = (2x+5)(x-1)$

$$2x^2 - 2x + 5x - 5$$

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

$$\frac{dy}{dx} = 4x + 3$$

(iii)  $y = \frac{1}{5}x^6 - \cos 5x$

$$\frac{dy}{dx} = \frac{1}{5} \cdot 6x^5 - \sin 5x \cdot 5$$

$$\frac{dy}{dx} = -6x^5 + 5 \sin 5x$$

(iv)  $y = e^{2x} \sin 3x$

$\frac{dy}{dx} = 2e^{2x} \sin 3x + e^{2x} 3 \cos 3x$

(v)  $y = \frac{\tan 7x}{\sin x}$

$\frac{dy}{dx} = \frac{7 \sec^2 7x}{\cos x}$

(vi)  $y = \sqrt{6x^2 - 30x + 5}$

$\frac{dy}{dx} = \frac{6x - 15}{\sqrt{6x^2 - 30x + 5}}$

(2)

i)  $\sin \alpha = 0.43$

$$\alpha = \sin^{-1} 0.43$$

$$\alpha = 25.46, 154.53$$

ii)

$\tan \alpha = -7$

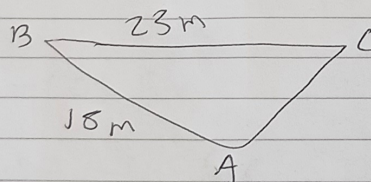
$$\tan^{-1} \left( \frac{-7}{5} \right) = 125.5, 305.54$$

iii)

$5 \cos \alpha = 3$

$$\cos^{-1}(0.6) = 53.13, 306.87$$

(3)



Angle  $A = 105^\circ$

Find length AC:

$$\text{Find } c = \frac{\sin^{-1} \left( \frac{\sin(105)}{23} \right) \times 18}{\sin 105} = 49.10 \times \sin 25.89 = 10.4m$$

Find B:  $105 + 49.11 = 154.11$   
 $180 - 154.11 = 25.89$

⑥

①  $5x^8 + 4x^3 + 5x - 1 \, dx$

$$\frac{5x^9}{9} + \frac{4x^4}{4} + \frac{5x^2}{2} - x + C$$

⑥

①  $5x^8 + 4x^3 + 5x - 1 \, dx$

$$\frac{5x^9}{9} + \frac{4x^4}{4} + \frac{5x^2}{2} - x + C$$