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Further Maths  
ACH144006  
05/05/2022

i)  $y = 5x^4 + 5x^2 + 3x - 19$

$$\frac{dy}{dx} = 20x^3 + 10x + 3x + 19$$

$$\frac{dy}{dx} = 20x^3 + 13x + 19$$

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

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

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

$$y = 2x^2 - 8x - 5$$

$$\frac{dy}{dx} = 4x - 8x - 5$$

$$\frac{dy}{dx} = 4x - 5$$

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

$$\frac{dy}{dx} = -\frac{6}{x^7} - 5 \sin 5x$$

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

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

v)  $\frac{\tan 7x}{\sin x}$

vi)  $y = \sqrt{6x^2 - 3x + 5}$

$$y = (6x^2 - 3x + 5)^{0.5}$$

$$\frac{dy}{dx} = 0.5(6x^2 - 3x + 5)^{-0.5} (12x - 3)$$

P2

2) i)

$$0^\circ \leq x \leq 360^\circ$$

$$\sin x = 0.43$$

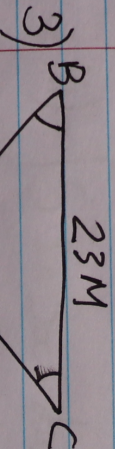
$$x = \sin^{-1}(0.43)$$

$$x = 25.46$$

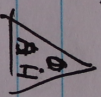
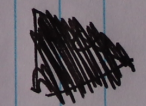
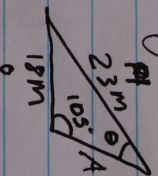
$$x = 154.524399$$

ii)  $\sin x = -7$

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i) angle C



SOHCAHTOA

$$\text{angle } C = 49.10^\circ$$

ii)  $49.10 + 105$   
 $= 154.1$

$$180 - 154.1 = 25.9^\circ$$

$$\text{angle } B = 25.9^\circ$$

iii) length AC = 10.40m

P3

i)  $\int x^8 + 4x^3 + 5x - 1 \, dx$

$$\therefore \int \frac{x^9}{9} + \frac{4x^4}{4} + \frac{5x^2}{2} - 1 \, dx$$

ii)  $\int 5x^2 (x^3 + 2x + 1) \, dx$

$$\therefore \int \frac{5x^3}{3} \, dx$$

iii)  $\int 5 \sin 3x \, dx$

$$\therefore 5 \int \sin 3x$$

$$5 \times \left( -\frac{1}{3} \cos 3x \right) + C$$

$$= -\frac{5}{3} \cos 3x + C$$

iv)

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