Ryan Calderon 5/5/22

2102952 Foundation Mathematics (ACHA3000)

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(i) $y=5x^4+5x^2+3x-19$ $y=\frac{d}{dx}(5x^4)+\frac{d}{dx}(5x^2)+\frac{d}{dx}(3x)-\frac{d}{dx}(19)$

$y=\frac{d}{dx}(5x^4+5x^2+3x-19)$

$y=5\times 4x^3+5\times 2x+3-0$ $\underline{y=20x^3+10x+3}$

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

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

$\underline{y=2x^2+3x-5}$

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

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

(iv) $y=e^{2x}\times\sin(3x)$ $y=\frac{d}{dx}(e^{2x}\times\sin(3x))$

$y=\frac{d}{dx}(e^{2x})\times\sin(3x)+e^{2x}\times\frac{d}{dx}(\sin(3x))$

$y=e^{2x}\times 2\sin(3x)+e^{2x}\times\cos(3x)\times 3$

$\underline{y=2e^{2x}\times\sin(3x)+3e^{2x}\times\cos(3x)}$

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

$y=\frac{d}{dx}\left(\frac{\tan(7x)}{\sin(x)}\right)$

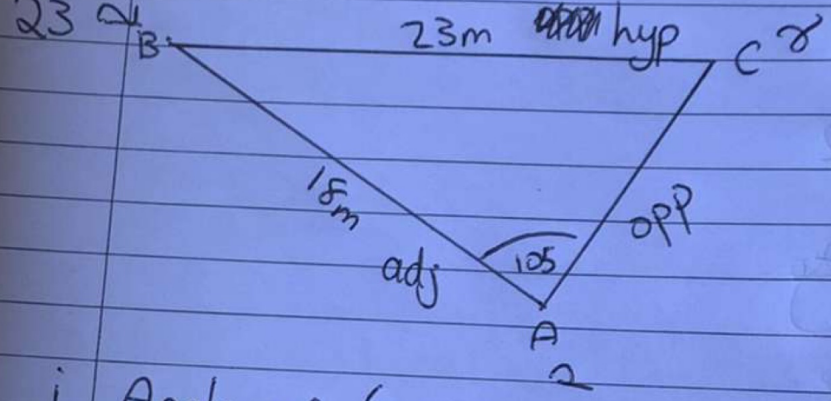
$y=\frac{d}{dx}\left\{\frac{(\tan(7x))\times\sin(x)-\tan(7x)\times\frac{d}{dx}(\sin(x))}{\sin(x)^2}\right\}$

$y=\frac{\sin(7x)^2\times 7\sin(x)-\tan(7x)\cos(x)}{\sin(x)^2}$

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$x = \frac{\cos^{-1}(3)}{5}$

$x = 145.08$ $180 - 145.08 = 34.92°$



i Angle of (

(R2) =

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(v) $y = \frac{7\sin(x) - \cos(7x)\sin(7x)\cos(x)}{\cos(7x)^2 \sin(x)^2}$

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

$y = \frac{d}{dx}\left(\sqrt{6x^2 - 3x + 5}\right)$

$y = \frac{d}{dg}(\sqrt{g}) \times \frac{d}{dx}(6x^2 - 3x + 5)$

$y = \frac{1}{2\sqrt{g}} \times (6 \times 2x - 3)$

$y = \frac{1}{2\sqrt{6x^2 - 3x + 5}} \times (6 \times 2x - 3)$

$y = \frac{12x - 3}{2\sqrt{6x - 3x + 5}}$

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i $\sin x = 0.43$

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

$x = 25.46°$

$180 - 25.46 = 154.54°$

ii $5\tan x = -7$

$x = \frac{\tan^{-1}(-7)}{5}$

$x = 16.37$

$180 - 16.37 = 163.63°$

iii $5\cos x = 3$

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24 $y = \frac{t(x^2+R)}{Q}$

$y = \frac{tx(x^2+R)}{Q}$

~~$y = \frac{tx^2+tR}{Q}$~~

$Qy = tx^2 + tR$

$\frac{-tx^2 = tR - Qy}{t}$

~~$y = \frac{tR - Qy}{t}$~~

$y = \frac{2y - tR}{t}$

$x = \frac{\sqrt{2yt - t^2R}}{t}$

$x = \frac{\sqrt{2yt - t^2R}}{t}$

25

i $3^{x+4} = 7x$

$x+4 = \log_3(7)x$

$x - \log_3(7)x = -4$

$(1 - \log_3(7))x = -4$

$\underline{\underline{x = 5.18643}}$

ii $\log(x+5) + \log(x+2) = \log(x+7) + \log(x+6)$

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

$\int_{0}^{4} \frac{x^9}{9} + \frac{4(4)^4}{4} + \frac{5(4)}{2} - [0]$

$[262144 + 64 + 20] - [\,]$

$= 262228$

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ii $\int 5x^2\left(\frac{3}{x}+2x+1\right)dx$

$\int \frac{x^3}{5} + \frac{x^2}{6}$

$\left[\frac{(5)^3}{5} + \frac{(6)^2}{6}\right] - [0]$

$[125 + 36] - [0]$

$= 161$

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

iv $\int_0^5 (x+5)(x+1)\,dx$

$\int_0^5 x^2 + x^2 + 5x + 6\,dx$

$$= \left[\frac{x^3}{3} + \frac{x^3}{3} + \frac{5x^2}{2} + 6x \right]$$

$$= \left[\frac{(5)^3}{3} + \frac{(5)^3}{3} + \frac{5(5)}{2} \right] - [0]$$

$$= [125 + 125 + 25] - [0]$$

$$= 275$$