

MATHS EXAM

05/5/2022

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

$$\frac{dy}{dx} = 20x^3 + 10x + 3 - 0$$

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

~~dy/dx~~ $y = 2x^2 - 2x + 5x - 5$

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

$$\frac{dy}{dx} = 4x + 3 - 0$$

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III. $y = \frac{1}{x^6} - \cos 5x$

$$y = x^{-6} - \cos 5x$$

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

IV. $y = e^{2x} \sin 3x$

$$\frac{du}{dx} = 2e^{2x} \quad \frac{dv}{dx} = 3 \cos 3x$$

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

V. $y = \frac{\tan 7x}{\sin x}$

$$\frac{du}{dx} = 7 \sec^2 7x \quad \frac{dv}{dx} = \cos x$$

$$\frac{dy}{dx} = (\sin x)(7 \sec^2 7x) - (\tan 7x)(\cos x)$$

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

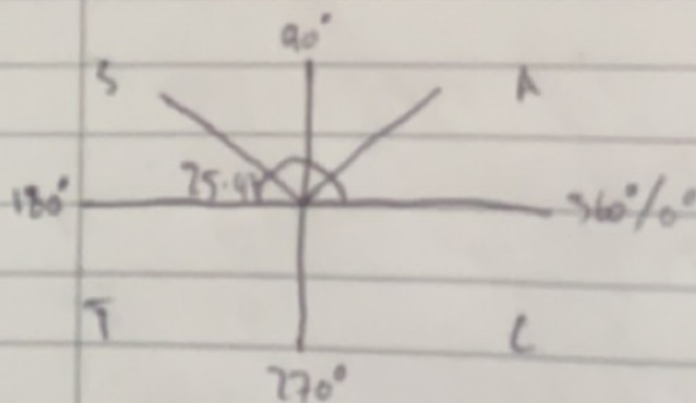
$$y = (6x^2 - 3x + 5)^{0.5}$$

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

2 i. $\sin x = 0.43$

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

$$x = \sin^{-1}(0.43) = 25.47$$



$$x = 180 - 25.47$$

ii. $5 \tan x = -7$

i. $5 \cos x = 3$

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

$$\cos x = \frac{3}{5}$$

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

$$x = 36.87 \quad \leftarrow \text{NOT THE ANSWER}$$

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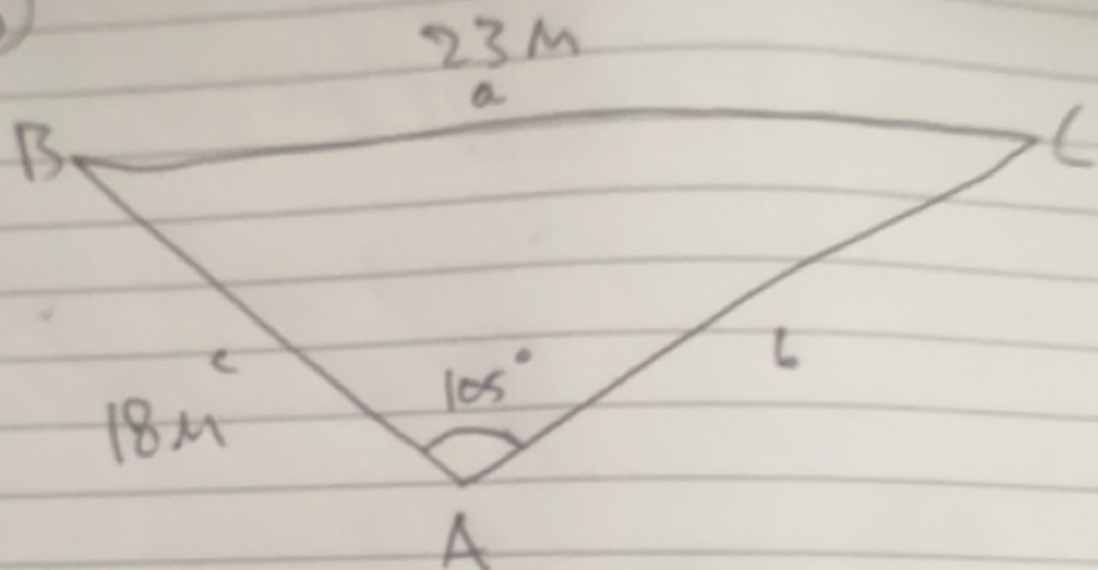
iii. $2180 - 36.82$

$$b = 143.18$$

$$x = 180 + 30.87$$

$$x = 210.87$$

③



$$i. \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{23}{\sin(105)} = \frac{b}{\sin B} = \frac{18}{\sin C}$$

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$$\frac{18 \sin 105}{73} = -0.7595$$

$$\sin^{-1}(-0.7595)$$

$$\boxed{\angle = 49.42}$$