

Exam

1=

i: $y = 5x^4 + 5x^2 + 3x - 19$ $5(4x^3) + 5(2x) + 3 - 19$ $\frac{dy}{dx} = 20x^3 + 10x + 3 - 19$

ii: $y = (2x+5)(x-1)$ $y = 2x^2 + 8x - 5$ $\frac{dy}{dx} = 4x + 8$

iii: $y = \frac{1}{x^6} \cdot \cos 5x$ $\frac{dy}{dx} = \left(\frac{1}{x^6} \cdot \cos(5x)\right)$ $\frac{dy}{dx} = -\frac{6}{x^7} + 5 \sin 5x$

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

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

iv: $y =$

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

vi: $y = \sqrt{6x^2 - 3x + 5}$ $y = (6x^2 - 3x + 5)^{\frac{1}{2}}$ $\frac{dy}{dx} = \frac{1}{2} (6x^2 - 3x + 5)^{-\frac{1}{2}} (12x - 3)$

2=

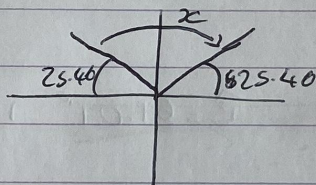
i: $\sin x = 0.43$

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

$x = 25.46^\circ$

$x = 180 - 25.46$

$x = 154.54^\circ$

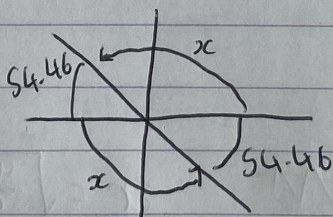


ii: $\tan x = -7$

$\tan x = \frac{7}{5}$

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

$x = 54.46^\circ$



$x = 180 - 54.46$

$x = 125.54^\circ$

$x = 360 - 54.46$

$x = 305.54^\circ$

$$\text{iii} = 5 \cos x = 3$$

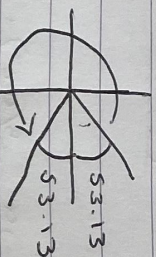
$$\cos x = \frac{3}{5}$$

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

$$x = 53.13^\circ$$

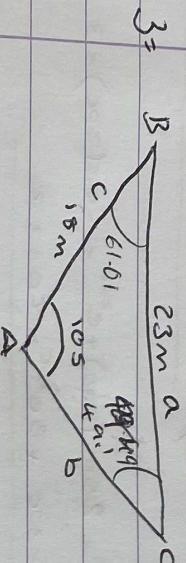
$$x = 180 - 53.13$$

$$x = 126.87$$



$$x = 360 - 53.13$$

$$x = 283.3^\circ$$



$$\frac{A}{\sin A} = \frac{B}{\sin B} = \frac{C}{\sin C}$$

i = find C

$$\frac{23}{\sin 105} = \frac{18}{\sin A} \Rightarrow \sin A = \frac{18 \sin 105}{23} \Rightarrow \sin A = \frac{18}{23}$$

$$\frac{18}{23} = \sin A$$

$$\sin C = \frac{C}{23}$$

$$\sin^{-1}\left(\frac{18}{23}\right) = C$$

$$C = 49.11^\circ$$

ii = find B

$$180 = 105 + 13.99 + B$$

$$B = 61.01^\circ$$

$$180 = 105 + 13.99 + B$$

$$B = 25.9^\circ$$

$$\text{iii} = (AC)^2 = 23^2 + 18^2 - 2(23)(18) \cos 105$$

$$(AC)^2 = 529 + 324 - 828(-0.258)$$

$$(AC)^2 = 853 - 828(213.624)$$

$$(AC)^2 = 639.376$$

$$AC = 25.28$$

$$y = \frac{b(x^2 + R)}{\theta}$$

$$y = 25.28$$

$$x = \sqrt{\frac{y\theta}{25.28} - R}$$

5:

$$i = 3x + 4 = 7x$$

$$\log_{4.3}(x+4) = \log_{7x} (2x+4) \log_3 = 2x \log_7$$

$$(2x+4) 0.4771 = 0.8450x$$

$$0.4771x - 0.8450x = 1.9084 \quad -0.3679x = 1.9084$$

$$x = 4.5184$$

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

$$(x+5)(x+2) = (x+7)(x+6)$$

$$x^2 + 2x + 5x + 10 = x^2 + 6x + 7x + 42$$

$$7x + 10 = 13x + 42$$

$$7x - 13x = 42 - 10$$

$$-6x = 32$$

$$x = -5.3$$

6:

$$i = \int x^8 + 4x^3 + 5x - 1 \, dx = \frac{x^9}{9} + \frac{4x^4}{4} + 5x - \frac{x^2}{2} + C$$

$$ii = \int 3x^2 (x^3 + 2x + 1) \, dx = \int 3x^5 + 6x^3 + 3x \, dx = \frac{3x^6}{6} + \frac{6x^4}{4} + \frac{3x^2}{2} + C$$

$$iii = \int 5 \sin 3x \, dx = \int 5 \cos 3x \, dx = \frac{5}{3} \sin 3x + C$$

$$iv = \int_0^5 (x+5)(x+1) \, dx = \int_0^5 x^2 + 6x + 5 \, dx = \int_0^5 x^2 + 6x + 5 \, dx$$

$$= \left[\frac{x^3}{3} + \frac{6x^2}{2} + 5x \right]_0^5 = \left[\frac{125}{3} + 150 + 25 \right] = 184.1667$$