

Module (ACHA 4006)

My Name's: ABDULAZIM MOHAMMADAIN

Student Number: 2008236

Page (1)

Differentiate

(i) $y = 7x^3 - 2x^2 + x + 2$

$$\frac{dy}{dx} = 21x^2 - 4x + 1$$

(ii) $y = (x+3)(x+2)$

$$y = x^2 + 2x + 3x + 6$$

$$y = x^2 + 5x + 6$$

$$\frac{dy}{dx} = 2x + 5$$

(iii) $y = \frac{1}{x^3} + \sin 3x$

$$\frac{dy}{dx} = x^{-2} - 3\cos 3x + C$$

(iv) $y = x^4 \tan 2x$

$$\frac{dy}{dx} = 4x^3 \sec^2 2x$$

(v) $y = \frac{e^{2x}}{\cos 2x} \rightarrow u$

$$\frac{dy}{dx} = \frac{v du}{dx} - \frac{u dv}{dx}$$

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

(vi) $y = (3x^2 + 2x + 1)^5$

$$5(3x^2 + 2x + 1)^4 (6x + 2)$$

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$$P = \sqrt{\frac{xy}{T}} + 3 \quad (x)$$

$$\frac{P^2}{T} = \frac{xy}{T} + 3$$

~~$$\frac{P^2}{T} = \frac{xy}{T} + 3$$~~

$$\frac{P^2}{y} = \frac{xy}{y} + 3$$

$$\frac{P^2}{y} = x + 3$$

$$\frac{P^2}{y} - 3 = x$$

pag (3)

$$(i) \int x^4 + 3x^2 - 3x + 1 \, dx$$

~~$$\frac{x^5}{5} + \frac{3x^3}{3} - \frac{3x^2}{2} + x + C$$~~

$$= \frac{x^5}{5} + x^3 - \frac{3x^2}{2} + x + C$$

$$(ii) \int (x-1)(x-3) \, dx$$

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

$$x^2 - 4x + 3$$

$$\boxed{\frac{x^3}{3} - 4\frac{x^2}{2} + x + C}$$

$$(iii) \int 3 \sec^2 2x \, dx$$

$$= 3 \int \frac{1}{2} \tan 2x$$

$$= \int \frac{3}{2} \tan 2x$$

$$(iv) \int_0^4 (x+3)(x+2) \, dx$$

$$\int_0^4 (x^2 + 2x + 3x + 6) \, dx$$

$$\int_0^4 (x^2 + 5x + 6) \, dx$$

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

$$[21 + 80 + x]$$

$$\boxed{101.3}$$

$$(v) \int_2^3 (x+1) + e^x \, dx$$

$$\frac{6e^3 + 53 - 6e^2}{6}$$

$$[21.52981413-]$$

Page (2)

Solve the following trigonometric equation for $0^\circ \leq x \leq 360^\circ$

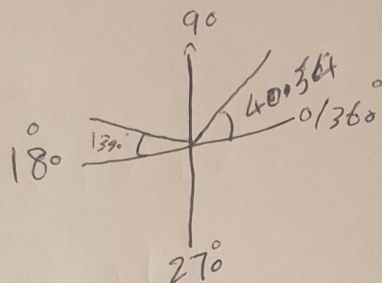
(i) $\sin x = 0.63$

$\sin^{-1}(0.63)$

$x = 40.54$

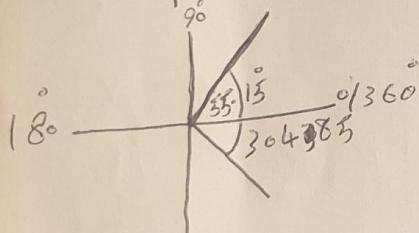
$180 - 40.54$

$x = 139.46$



(ii) $7 \cos x = 4$

$\cos^{-1}\left(\frac{4}{7}\right) = 55.15$



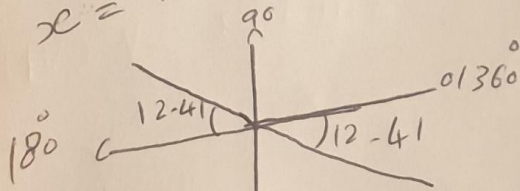
$x = 360 - 55.15 = 304.85$

$(55.15, 304.85)$

(iii) $\tan x = -0.22$

$\tan^{-1}(-0.22)$

$x = 12.41$ No an Answer

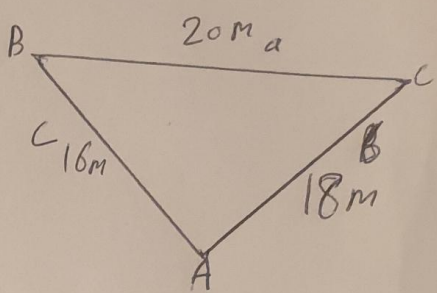


$x = 180 - 12.41 = 167.59$

$x = 360 - 12.41 = 347.59$

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Find the angle at A



$a^2 = b^2 + c^2 - 2bc \cos A$

$(20)^2 = 18^2 + 16^2 - 2(18)(16) \cos A$

$400 = 324 + 256 - 576 \cos A$

$400 - 324 - 256 = -576 \cos A$

$\frac{-180}{-576} = \frac{-576}{-576} \cos A$

$0.3125 = \cos A$

$\cos^{-1}(0.3125)$

$A = 71.79^\circ$

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