

6th May 2021 ACH/006 2005245

### QUESTION ONE

Differentiate the following functions:

(i)  $y = 7x^3 - 2x^2 + x + 2$   $\frac{dy}{dx} = 21x^2 - 4x + 1$   
 ~~$27x^2 - 4 - 2x + 2$~~

(ii)  $y = (x+3)(x+2)$   $\frac{dy}{dx} = 2x+5$   
 ~~$x \times 2 + 2x - 3 + 2$~~

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

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

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

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

(20 marks)

### QUESTION TWO

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

(i)  $\sin x = 0.65$

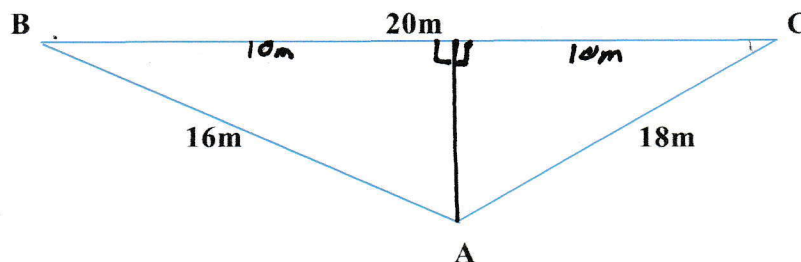
(ii)  $7 \cos x = 4$

(iii)  $\tan x = -0.22$

(9 marks)

### QUESTION THREE

Find the angle at A in the following triangle:



(5 marks)

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Q1) i)  $7x^3 - 2x^2 + x + 2$

$$7x^3 = 21 \quad = 1 \quad -2$$

$$7x^3 - x^2 = 7x^3 - x = 7x^2$$

$$\frac{dy}{dx} y = 7x^3 = \frac{dy}{dx} = 21x^2$$

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

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

ii)  $y = (x+3)(x+2)$   $\frac{dy}{dx} = 2x+5$

$\begin{matrix} + & + \\ \underline{2x} & \underline{5} \end{matrix}$

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

$$\frac{dy}{dx} \left( \frac{1}{x^3} + \sin(3x) \right)$$

$$\frac{dy}{dx} \left( \frac{1}{x^3} \right) + \frac{dy}{dx} (\sin(3x))$$

$$\frac{dy}{dx}$$