

Q1

$$i) \quad g = 5x^4 + 5x^2 + 3x - 19$$

$$\frac{dg}{dx} = 20x^3 + 10x + 3$$

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

$$\therefore \begin{array}{l} 2x^2 + 5x - 2x - 5 \\ 2x^2 + 3x - 5 \end{array}$$

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

Q1

$$\text{iii } \frac{1}{x^6} - \cos 5x$$

$$\frac{dy}{dx} = -6x^{-7} + 5\sin 5x$$

$$\text{iv } y = \underset{u}{e^{2x}} \underset{v}{\sin 3x}$$

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

$$\text{v } y = \frac{\tan 7x}{\sin x} \quad \begin{matrix} u \\ v \end{matrix}$$

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

Q1

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

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

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

Q2

$$i. \sin x = 0.43 \rightarrow \sin^{-1} = \boxed{25.467^\circ}$$

$$+ \quad 180 - 25.467 = \boxed{154.532^\circ}$$

$$ii. 5 \tan x = -7$$

$$\tan x = \frac{-7}{5} = -1.4$$

$$\boxed{125.53^\circ}$$

$$\boxed{305.53^\circ}$$

$$iii. 5 \cos x = 3$$

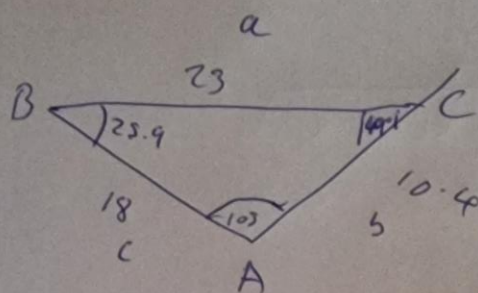
$$\cos x = \frac{3}{5} = 0.6$$

$$\cos^{-1} 0.6 = 53.13$$

$$360 - 53.13$$

$$x = 53.15^\circ, 306.86^\circ$$

Q3



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

$$\frac{23}{\sin 105} = \frac{b}{\sin b} = \frac{18}{\sin c}$$

$$\sin c = \frac{18 \sin A}{a} = 0.755 \quad \sin^{-1} 0.755 = 49.1$$

$$180 - 105 - 49.1 = 25.9 = B$$

$$b = \frac{a \sin B}{\sin A} = 10.4$$

$$i = 49.1^\circ$$

$$ii = 25.9^\circ$$

$$iii = 10.4m$$

Q4 $y = \frac{t(x^2 + R)}{\theta}$

$$y\theta = t(x^2 + R)$$

$$\frac{y\theta}{t} = x^2 + R$$

$$\left(\frac{y\theta}{t}\right) - R = x^2$$

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

Q5

$$; \quad 3x + 4 \geq 7x$$

$$; \quad \cancel{40} (x+4) \log 3 \geq x \log 7$$

$$; \quad (x+4)1.09 \geq x1.94$$

$$1.09x + 4.39 \geq 1.94x$$

$$4.39 \geq 1.94x - 1.09x$$

$$4.39 \geq 0.85x$$

$$\frac{4.39}{0.85} \geq x$$

$$x \geq 5.16$$

Q 5

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

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

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

$$x^2 + 7x + 10 = x^2 + 13x + 42$$

$$x^2 + 7x = x^2 + 13x + 32$$

$$7x = 13x + 32$$

$$-6x = 32$$

$$x = \frac{32}{-6}$$

$$x = -5.33$$