

Question One

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

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

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

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

iii) $y = \frac{1}{3x} - \cos 5x$

$y = x^{-\frac{1}{3}} - \cos 5x$

$$\frac{dy}{dx} = -\frac{1}{3}x^{-\frac{4}{3}} + 5\sin 5x$$

iv) $y = e^{2x} \sin 3x$

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

v) $y = \frac{\tan 7x}{\sin x}$

$$\frac{dy}{dx} = \frac{7\sec^2 7x}{\cos x}$$

vi)

Question Two

i) $\sin x = 0.43$

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

$x = 25.46^\circ, 154.53^\circ$

ii) $5 \tan x = -7$

$\tan^{-1}\left(-\frac{7}{5}\right) = 125.54^\circ, 305.54^\circ$

iii) $5 \cos x = 3$

$\cos^{-1}(0.6) = 53.13^\circ, 306.87^\circ$

Question Three

i) $\left(\frac{\sin 105}{23} \times 18\right) \sin^{-1} = 49.11^\circ$

ii) $105 + 49.11 = 154.11^\circ$
 $180 - 154.11 = 25.89^\circ$

iii) $\frac{23}{\sin 105} \times \sin 25.89 = 10.40 \text{ m}$

Question Four

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

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

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

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

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Further Mathematics

Question Five

i) $3^{x+4} = 7^x$

$$\log 3^{x+4} = \log 7^x$$

~~$$\log 3^{x+4} = \log 7^x$$~~

$$(x+4)\log 3 = x\log 7$$

$$(x+4) \cdot 0.48 = 0.85x$$

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