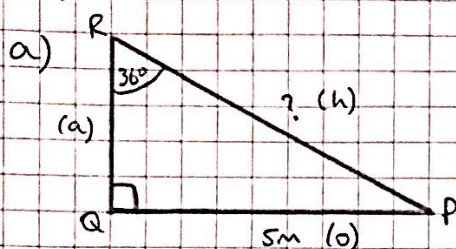


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4) a) $a = 5m$ $\alpha = 36^\circ$ $h = ?$ 

$$\sin 36 = \frac{5}{h}$$

$$h = \frac{5}{\sin 36}$$

$$h = 8.51m \quad (\text{side } RP = 8.51m)$$

b) Find length of BC: (a)

(cosine rule): $a^2 = b^2 + c^2 - 2bc \cos A$

$$a^2 = (12^2) + (7^2) - 2(12)(7) \cos 105$$

$$a^2 = 193 - -43.48$$

$$a = \sqrt{236.48}$$

$$a = 15.38m$$

$$BC = 15.38m$$

c) Find Angle A:

(cosine rule): $(25^2) = (21^2) + (20^2) - 2(21)(20) \cos A$

$$625 = 841 - 840 \cos A$$

$$625 - 841 = -840 \cos A$$

$$-216 = -840 \cos A$$

$$\frac{-216}{-840} = \cos A$$

$$0.26 = \cos A$$

$$\cos^{-1}(0.26) = A$$

$$A = 75.10^\circ$$

3. a) $\int 5x^2 + 6x + 5 \, dx$

$$y = \frac{5x^3}{3} + \frac{6x^2}{2} + 5x + c$$

b) $\int \frac{1}{x^8} \, dx$

$$\int x^{-8} \, dx$$

$$y = \frac{x^{-7}}{-7} + c$$

$$y = \frac{x^{-7}}{-7} + c$$

c) $\int 3 \sin 4x \, dx$

$$y = -\frac{3}{4} \cos 4x + c$$

d) $\int_2^5 (x+5)(x+2) \, dx$

$$\int_2^5 x^2 + 7x + 10 \, dx$$

$$y = \frac{x^3}{3} + \frac{7x^2}{2} + 10x + c$$

$$\left[\begin{array}{l} {}^5y = \frac{(5^3)}{3} + \frac{7(5^2)}{2} + 10(5) + c \\ {}^5y = 41.67 + 87.5 + 50 + c \\ {}^5y = 179.17 \end{array} \right]$$

$$\left[\begin{array}{l} {}^2y = \frac{(2^3)}{3} + \frac{7(2^2)}{2} + 10(2) + c \\ {}^2y = 2.67 + 14 + 20 + c \\ {}^2y = 36.67 \end{array} \right]$$

$$y = {}^5y - {}^2y$$

$$y = 179.17 - 36.67$$

$$y = 142.50$$

g) $y = \frac{e^{6x}}{\sin x} \begin{matrix} \uparrow u \\ \downarrow v \end{matrix}$

$$\frac{du}{dx} = 6e^{6x} \quad \frac{dv}{dx} = \cos x$$

$$\frac{dy}{dx} = \frac{(\sin x)(6e^{6x}) - \cancel{6}(e^{6x})(\cos x)}{(\sin x)^2}$$

h) $y = (6x^3 + 2x + 3)^5$

$$\frac{dy}{dx} = 5(6x^3 + 2x + 3)^4 (18x^2 + 2)$$

2. a) $y = 8x^5 - 4x^3 + 2x + 5$

$$\frac{dy}{dx} = 40x^4 - 12x^2 + 2$$

b) $y = (x+10)(x-1)$

$$y = x^2 + 9x - 10$$

$$\frac{dy}{dx} = 2x + 9$$

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

$$y = 10x^5 + 25x^4 + 5x^3$$

$$\frac{dy}{dx} = 50x^4 + 100x^3 + 15x^2$$

d) $y = \tan 5x - \cos x$

$$\frac{dy}{dx} = 5 \sec^2 5x + \sin x \quad (- - = +)$$

e) $y = \frac{1}{x^3}$

$$y = x^{-3}$$

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

f) $y = \underbrace{x^3}_u \underbrace{\sin 5x}_v$

$$\frac{du}{dx} = 3x^2 \quad \frac{dv}{dx} = 5 \cos 5x$$

$$\frac{dy}{dx} = (\sin 5x)(3x^2) + (x^3)(5 \cos 5x)$$

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① a) $\sin x = 0.82$

$x = \sin^{-1}(0.82)$

$x = 55.08$

$x = 180 - 55.08$

$x = 124.92$



b) $7 \tan x = 3$

$\tan x = \frac{3}{7}$

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

$x = 23.20$

$x = 180 + 23.20$

$x = 203.20$



c) $\cos x = -0.53$

$x = \cos^{-1}(0.53)$

$x = 57.99$ (Not final answer)

$x = 180 - 57.99$

$x = 122.01$

$x = 180 + 57.99$

$x = 237.99$

