

①

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

$$y = \frac{d}{dx}(5x^4 + 5x^2 + 3x - 19)$$

$$y = \frac{d}{dx}(5x^4) + \frac{d}{dx}(5x^2) + \frac{d}{dx}(3x) - \frac{d}{dx}(19)$$

$$y = 5 \times 4x^3 + 5 \times 2x + 3 - 0$$

$$y = 20x^3 + 10x + 3$$

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

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

$$y = 2x^2 + 3x - 5$$

$$iii) y = \frac{1}{x^2} - \cos 5x$$

~~$$y = \frac{1}{x^2} - \cos(5x)$$~~
$$y = \frac{1}{x^2} - \frac{\cos(5x)}{1}$$

$$y = \frac{1}{x^2} - \frac{x^2 \times \cos(5x)}{x^2 \times 1}$$

$$y = \frac{1}{x^2} - \frac{x^2 \times \cos(5x)}{x^2}$$

$$y = \frac{1 - x^2 \times \cos(5x)}{x^2}$$

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

$$y = \frac{d}{dx} (e^{2x} \times \sin(3x))$$

$$y = \frac{d}{dx} (e^{2x}) \times \sin(3x) + e^{2x} \times \frac{d}{dx} (\sin(3x))$$

$$y = e^{2x} \times 2\sin(3x) + e^{2x} \times \cos(3x) \times 3$$

$$y = 2e^{2x} \times \sin(3x) + 3e^{2x} \times \cos(3x)$$

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

$$y = \frac{d}{dx} \left(\frac{\tan 7x}{\sin x} \right)$$

$$y = \frac{\frac{d}{dx} (\tan 7x) \times \sin x - \tan 7x \times \frac{d}{dx} \sin x}{\sin^2 x}$$

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

$$y = \frac{7\sin x - \cos 7x \sin x - \tan 7x \cos x}{\sin^2 x}$$

$$\text{vi)} \quad y = \sqrt{6x^2 - 3x + 5}$$

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

②

SOLVE FOR $0^\circ \leq x \leq 360^\circ$

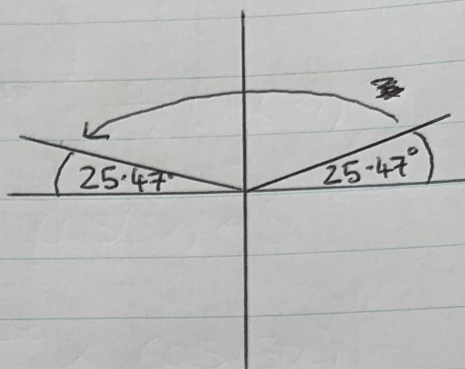
i) $\sin x = 0.43$

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

$x = 25.47^\circ$

$180 - 25.47$

$x = 154.53^\circ$



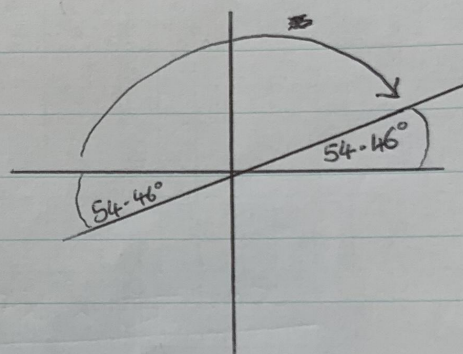
ii) $5 \tan x = -7$

$x = \tan^{-1}\left(\frac{7}{5}\right)$

$x = 54.46^\circ$

$x = 360 - 54.46$

$x = 305.54^\circ$



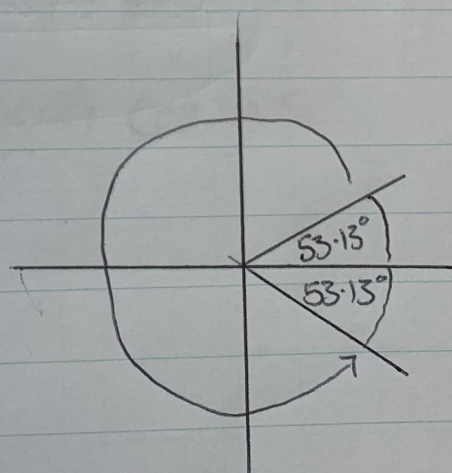
iii) $5 \cos x = 3$

$x = \cos^{-1}\left(\frac{3}{5}\right)$

$x = 53.13^\circ$

$x = 360 - 53.13^\circ$

$x = 306.87^\circ$



④

MAKE x THE SUBJECT.

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

~~scribbles~~

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

⑤

SOLVE FOR x

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

$$x + 4 = \log_3(7^x)$$

$$x - \log_3(7^x) = -4$$

$$(1 - \log_3(7))x = -4$$

$$x = 5.19$$

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

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

~~scribbles~~

$$x^2 + 2x + 5x + 10 = x^2 + 6x + 7x + 42$$

~~scribbles~~

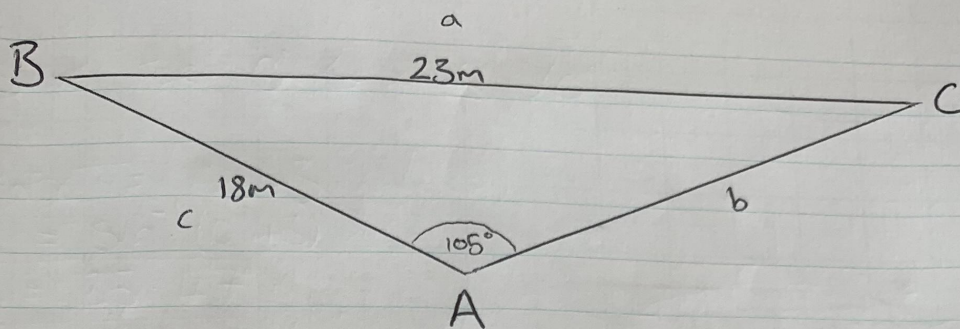
$$2x + 5x + 10 = 6x + 7x + 42$$

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

$$7x - 13x = 42 - 10$$

$$x = -5.3$$

3



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

~~$\frac{\sin(105)}{23} \times 18 = \sin(C)$~~
$$\frac{\sin(105)}{23} \times 18 = \sin(C)$$

~~$\frac{0.966}{23} \times 18 = \sin(C)$~~
$$\sin(C) = 0.756$$

$$\sin^{-1}(0.756) = 49.11^\circ$$

$$\boxed{\text{ANGLE } C = 49.11^\circ}$$

ii)
$$\boxed{180 - 105 - 49.11 = 25.89^\circ}$$

iii)
$$AC^2 = 23^2 + 18^2 - 2(23)(18) \cos 105$$

$$1067 - 30$$

$$\boxed{AC = 32.67^\circ}$$

⑥

$$i) \int x^8 + 4x^3 + 5x - 1 \, dx$$

$$\frac{x^9}{9} + \frac{4x^4}{4} + 5x$$

$$\boxed{\frac{x^9}{9} + x^4 + 5x + C}$$

$$ii) \int 5x^2(x^3 + 2x + 1) \, dx$$

$$\boxed{5x^6 + 2x + 1 + 5x^2 + C}$$

$$iii) \int 5 \sin 3x \, dx$$

$$5 \int \cos 3x \, dx$$

$$\boxed{5 \times \frac{1}{3} \cos 3x + C}$$

$$iv) \int_0^5 (x+5)(x+1) \, dx$$

$$\int_0^5 x^2 + x + 5x + 6$$