

①

$$(d) y = e^{2x} \sin 3x.$$

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

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

$$y = uv$$

$$\frac{dy}{dx} = v \frac{du}{dx} + u \frac{dv}{dx}$$

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

$$\frac{du}{dx} = \tan 7x \quad \frac{dv}{dx} = \sin x$$

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

$$\frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

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

$$\frac{dy}{dx} = \sqrt{3x^2 + 5}$$

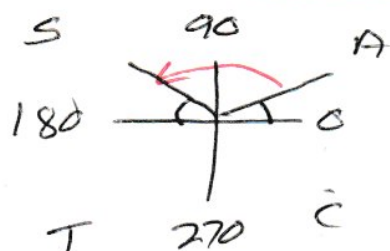
② ① $\sin x = 0.43$

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

$$x = 25.47^\circ$$

$$x = 180 - 25.47$$

$$x = 154.53^\circ$$

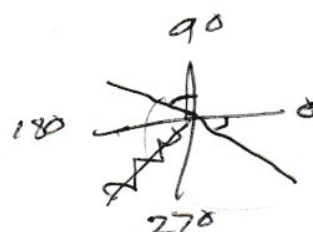


② $5 \tan x = -7$

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

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

$$x = -54.46^\circ$$



$$x = -270 - 54.46$$

$$x = 215.54^\circ$$

~~$$x = 324.46^\circ$$~~

$$x = -324.46^\circ$$

③ $5 \cos x = 3$

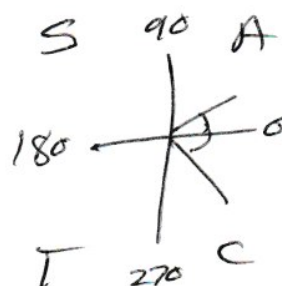
$$\cos x = \frac{3}{5}$$

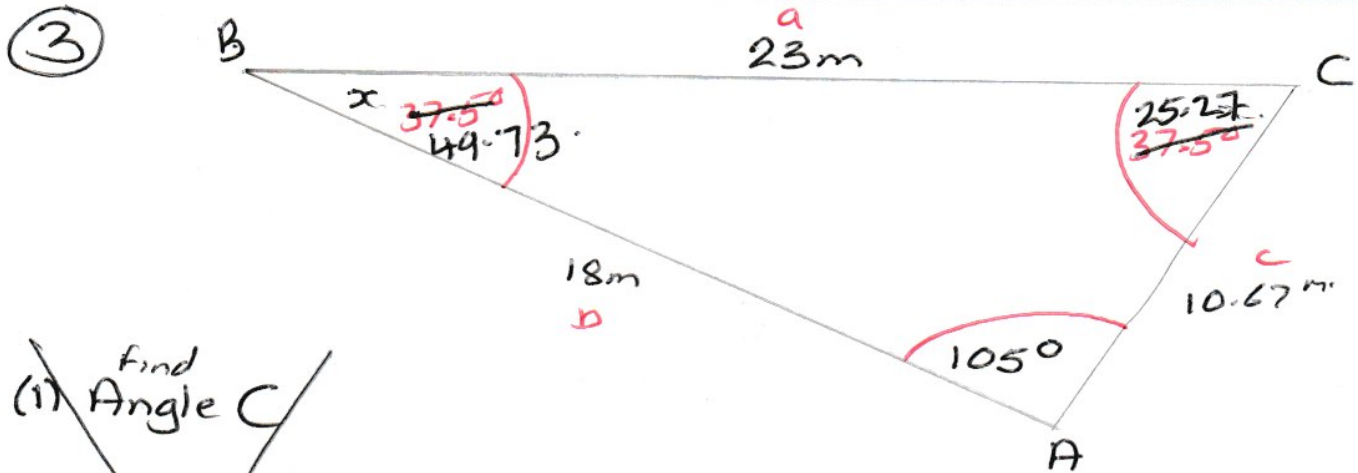
$$x = \cos^{-1}\left(\frac{3}{5}\right)$$

$$x = 60^\circ$$

$$x = 360 - 60$$

$$x = 300^\circ$$





(i) Find Angle C

$$x + x + 105 = 180$$

$$2x + 105 = 180$$

$$2x = 180 - 105$$

$$2x = 75$$

$$x = \frac{75}{2}$$

$$x = 37.5^\circ$$

$$\therefore \text{Angle C} = 37.5^\circ$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$c^2 = a^2 + b^2 - 2ab \cos A$$

$$c^2 = 23^2 + 18^2 - 2(23)(18) \cos 105^\circ$$

$$c^2 = 529 + 324 - 214.30$$

$$c^2 = 529 + 324 - 214.30$$

$$\sqrt{c^2} = 638.7$$

$$c = \pm 25.27^\circ$$

(ii) Find Angle B

$$\therefore \text{Angle B} = 37.5^\circ$$

$$180^\circ - 105^\circ - 25.27^\circ$$

$$\therefore \text{Angle B} = 49.73^\circ$$

(iii) length AC.

$$c^2 = 23^2 + 18^2 - 2(23)(18) \cos 105^\circ$$

$$c^2 = 10.67m$$

$$AC = 10.67m$$

$$AC = 11m ?$$

$$c^2 = a^2 + b^2 - 2ab \cos$$

$$(4) \quad y = \frac{t(x^2 + R)}{\theta}$$

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

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

$$(y\theta - R)^2 = t^2$$

(5)

$$(1) \quad 3^{x+4} = 7x$$

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

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

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

$$(x+4)0.47 = 0.84x$$

$$0.47x + 1.88 = 0.84x$$

$$0.47x - 0.84x = -1.88$$

$$-0.37x = -1.88$$

$$x = \frac{-1.88}{-0.37}$$

$$x = 5.08$$

⑤
⑪ $\log(x+5) + \log(x+2) = \log(x+7) + \log(x+6)$

$$\cancel{\log}(x+5) + \cancel{\log}(x+2) = \cancel{\log}(x+7) + \cancel{\log}(x+6)$$

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

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

$$\cancel{x^2} + \cancel{x} + 5x + 10 = \cancel{x^2} + \cancel{x} + 7x + 42$$

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

$$10 - 42 = 7x - 5x$$

$$-32 = 2x$$

$$\frac{-32}{2} = x$$

$$-16 = x$$

⑥

$$\textcircled{1} \int x^8 + 4x^3 + 5x - 1 \, dx.$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$\frac{x^9}{9} + \frac{4x^4}{4} + \frac{5x^2}{2} - 1x + C$$

$$\textcircled{11} \int 5x^2(x^3 + 2x + 1) \, dx.$$

$$5x^2(2x^4 + 1) \, dx.$$

$$\frac{5x^2}{2}$$

$$\textcircled{14} \int 5 \sin 3x \, dx.$$

$$5 \int \sin 3x \, dx.$$

$$= 5 \left(\frac{1}{3} \sin 3x \right) + C.$$

$$= \frac{5}{3} \sin 3x + C$$

$$\textcircled{14} \int_0^5 (x+5)(x+1) \, dx$$

$$\int_0^5 \cancel{5x} x^2 + 5x + 5 \, dx$$

$$= \left[\frac{x^3}{3} + \frac{5x^2}{2} + 5x \right]_0^5$$

①

$$\textcircled{a} \ y = 5x^4 + 5x^2 + 3x - 19$$

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

$$y = x^n$$
$$\frac{dy}{dx} = nx^{n-1}$$

$$\textcircled{b} \ y = (2x+5)(x-1)$$

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

$$y = 2x^3 + 7x - 5$$

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

$$\frac{dy}{dx} = 6x^2 + 3$$

$$\textcircled{c} \ y = \frac{1}{x^6} - \cos 5x$$

$$y = x^{-6} - \cos 5x$$

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