

$$a) \quad y' = 2x + 3$$

$$= 2(1) + 3$$

$$m = 5$$

$$\therefore y - y_1 = m(x - x_1)$$

$$y - 4 = 5(x - 1)$$

$$y - 4 = 5x - 5$$

$$y = 5x - 1$$

$$b) \quad y - y_1 = \frac{y_2 - y_1}{x_2 - x_1} (x - x_1)$$

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

$$y - 5 = \frac{-2}{3} (x + 2)$$

$$3y - 15 = -x - 2$$

$$3y = -x + 13$$

$$\therefore x + 3y - 13 = 0.$$

$$ii) \quad d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(4 + 2)^2 + (3 - 5)^2}$$

$$= \sqrt{36 + 4}$$

$$= \sqrt{40} = \sqrt{4 \cdot 10}$$

$$= 2\sqrt{10} \text{ units}$$



$$\text{iii) } \left| \frac{ax_1 + by_1 + c}{\sqrt{a^2 + b^2}} \right| \quad (0,0) \quad x + 3y - 13$$

~~$$\frac{(0)(1) + (0)(3) - 13}{\sqrt{1^2 + 3^2}}$$~~

$$\left| \frac{1(0) + 3(0) - 13}{\sqrt{1^2 + 3^2}} \right|$$

$$= \left| \frac{-13}{\sqrt{10}} \right|$$

$$= \therefore \frac{13}{\sqrt{10}} \text{ units}$$

$$\text{or } \frac{13}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}}$$

$$= \frac{13\sqrt{10}}{10} \text{ units}$$

$$\text{iv) } d. \text{ from } AO \quad (-2, 5) \quad (0, 0)$$

$$\sqrt{(0+2)^2 + (0-5)^2}$$

$$= \sqrt{4 + 25}$$

$$= \sqrt{29}$$

$$\therefore \text{Area of para.} = db$$

$$= AO \cdot AB$$

$$= \sqrt{29} \times \sqrt{40}$$

$$= 34.05877273$$

$$\hat{=} 34 \text{ units}^2$$



$$v) \left| \frac{ax_1 + by_1 + c}{\sqrt{a^2 + b^2}} \right|$$

$$\left| \frac{(0)(5) + (0)(2) - 26}{\sqrt{25 + 4}} \right|$$

$$\left| \frac{-26}{\sqrt{29}} \right|$$

perpen dist. =  $\boxed{\frac{26}{\sqrt{29}}}$

$$\text{OR } \frac{26}{\sqrt{29}} \times \frac{\sqrt{29}}{\sqrt{29}}$$

$$\frac{26\sqrt{29}}{29}$$

(0,0) & BC

line <sup>AB</sup>  $m = \frac{0-5}{0-2} = \frac{-5}{-2}$

line BC

$$y - y_1 = m(x - x_1)$$

$$y - 3 = \frac{-5}{2}(x - 4)$$

$$2y - 6 = -5x + 20$$

$$2y = -5x + 26$$

$$\text{BC: } 5x + 2y - 26 = 0$$