

Start here for

Question Number: **3**

a)

(i) Midpoint of AB

$$\therefore M = \left(\frac{-2+12}{2}, \frac{-4+6}{2} \right)$$

$$M = (5, 1)$$

$$(ii) \frac{y^2 - y_1^2}{x^2 - x_1^2}$$

$$= \frac{8-6}{6-12}$$

$$= -\frac{1}{3}$$

(ii) $\triangle ABC \cong \triangle AMN$ $\angle CAB = \angle NAM$ (common angle). ~~$\angle ANM = \angle ACB$ (corresponding)~~ $AN = NC$ (N is midpoint of AC) $AM = MB$ (M is midpoint of AB) $\therefore \triangle ABC \cong \triangle AMN$ SSA.(iii) $M(5, 1)$ $N(2, 2)$

$$\frac{2-1}{2-5} =$$

$$\therefore y-1 = -\frac{1}{3}(x-1)$$

$$m = -\frac{1}{3}$$

$$3y-3 = -x+1$$

$$\uparrow x+3y-4=0$$

$$v) \sqrt{(12-6)^2 + (6-8)^2}$$

$$\sqrt{36 + 4}$$

$$\sqrt{40}$$

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

$$vi) \frac{|ax + by + c|}{\sqrt{a^2 + b^2}}$$

$$\frac{|1(-2) + 3(-4) - 30|}{\sqrt{1^2 + 3^2}}$$

$$\frac{|-2 - 12 - 30|}{\sqrt{10}}$$

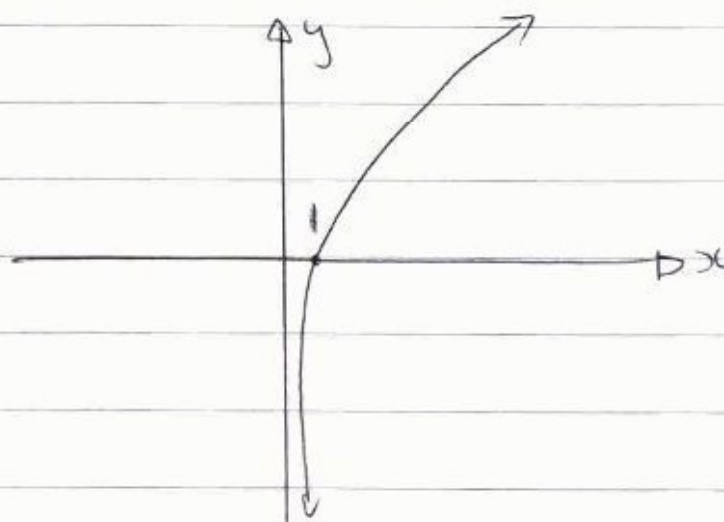
$$\therefore = \frac{|-44|}{\sqrt{10}} \therefore = \frac{44}{\sqrt{10}}$$

$$y - 6 = -\frac{1}{3}(x - 12)$$

$$3y - 18 = -x + 12$$

$$x + 3y = 30$$

b) i)



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$$\text{ii) } \frac{h}{2} (y_0 + y_1 + 2(\text{middle } y))$$

$$\int_1^3 e^{2x}$$

$$e^3 - e^1$$

$$\frac{h}{2} (1 + 3 + 2(2))$$

$$= 4 \text{ units}^3$$

$$\int_1^3 e^{2x} \ln x$$

$$\int_1^3 e^x$$

$$e^3 - e^1 = 17.36$$

is greater than the value in (i) as (i) is an approximation and isn't completely accurate.

