

Start here for  
Question Number: **3**

$$a1. \frac{12-2}{2}, \frac{6-4}{2}$$

$$= (4, 1)$$

$$ii. \frac{\text{rise}}{\text{run}} = \frac{2}{-6}$$

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

iii.  $\angle CAB$  is a common  $\angle$   
M is the midpoint of AB  
~~M of MN = M of BC~~

$$m_{MN} = \frac{1}{-2}$$

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

N is the midpoint of CA

$\therefore \triangle ABC$  is similar to  $\triangle AMN$

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

$$y - 2 = -\frac{1}{2}(x - 2)$$

$$y = -\frac{1}{2}x + 1 + 2$$

$$y = -\frac{1}{2}x + 3$$

$$2y = -x + 6$$

$$2y + x - 6 = 0$$

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

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

$$= \sqrt{(6)^2 + (-2)^2}$$

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

$$= \sqrt{40}$$

$$= \sqrt{4 \times 10}$$

$$= 2\sqrt{10}$$

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

$$a = 2$$

$$b = 1$$

$$c = -6$$

$$x_1 = -2$$

$$y_1 = -4$$

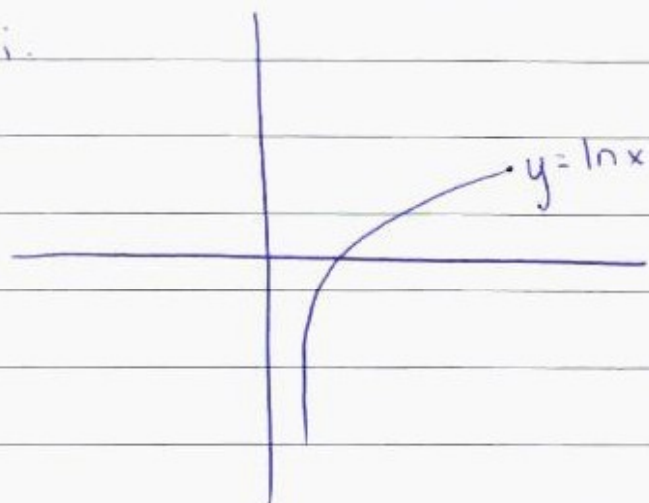
$$\left| \frac{2(-2) + 1(-4) + 6}{\sqrt{2^2 + 1^2}} \right|$$

$$= \frac{-4}{\sqrt{5}}$$

$$= \frac{4}{\sqrt{5}}$$

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bi.



$$ii. \frac{b-a}{2} [f(a) + f(b)]$$

$$y = \int_1^3 \ln x$$

$$= \frac{1.10 - 0}{2} [0 + 1.10]$$

$$= 0.55 (1.10)$$

$$= 0.605$$

x	1	2	3
f(x)	0	0.69	1.10

$$iii. \int_1^3 \ln x \, dx$$

$$= \left[ \frac{1}{x} \right]_1^3$$

$$= -\frac{2}{3}$$

$\therefore$  the approximation in part (ii) is less than part (iii).

