Start here for Question Number: 3

(a)

(i) M = midpoint of (A,B) (given)

$\therefore$ M = (5,1)

(ii) $\frac{y_2 - y_1}{x_2 - x_1}$ $\quad$ $(\overset{x_1}{6}, \overset{y_1}{8})$ $(\overset{x_2}{12}, \overset{y_2}{6})$

$\frac{(6-8)}{(12-6)}$

$= \frac{-2}{6}$

$= \frac{1}{3}$

iii ΔABC Similar to ΔAMN

A is common

N is the midpoint of AC (given)

M is the midpoint of AB (given)

$\therefore$ by SAS ΔABC is similar to ΔAMN

iv for MN = $\quad$ (5,1) (2,2)

$y - y_1 = m(x - x_1)$ $\quad$ $m = \frac{5-2}{1-2}$

$y - 2 = -3(x - 2)$

$y = -3x + 5 \quad +2$ $\quad$ $\frac{3}{1}$

$y = -3x + 7$

$= -3$

6.32

(v)

$(6, 8)$ $(12, 6)$ with labels x_1, y_1 above $(6, 8)$ and x_2, y_2 above $(12, 6)$

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

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

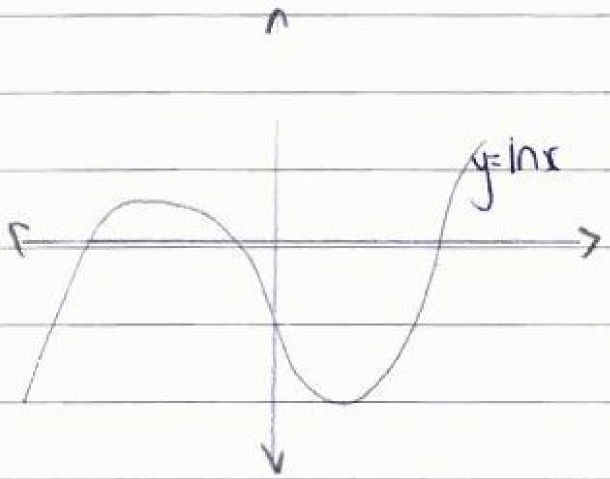
$d = 6.32$

(vi) pd =

$(-2, -4)$ (

(b)

i $y = \ln x$



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(b)

(ii) $\int_1^3 \ln x \, dx$

$\frac{h}{3}(y_1 - 0) + 4(y_1 + y_3 \ldots) + 2(y_2 + y_4 \ldots)$

iii The approximation would be greater than the exact value of $\int_1^3 \ln x \, dx$ due to the ~~op~~ chosen three function values.