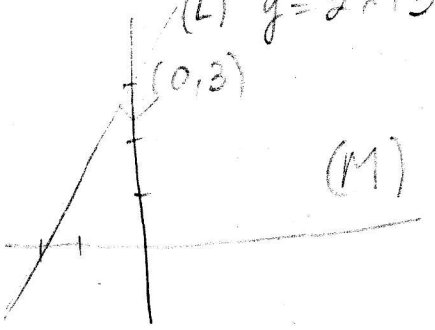
AMATYC 2008

Problem 1



$(L)\ y = 2x+3$

$m_L = 2$

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

$M: y-3 = -\frac{1}{2}(x-0)$

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

$x=-4 \Rightarrow y = (-\frac{1}{2})\cdot(-4)+3 = 5$

Answer : A

Problem 2

$$\begin{cases} S + 5\%S = L + 1200 \\ L - 1\%S = S \end{cases} \Rightarrow \begin{cases} 105\%S = L + 1200 \\ 101\%S = L \end{cases}$$

$$\frac{105}{101} = \frac{L+1200}{L} \Rightarrow L = 30,300$$

Answer : D

Problem 3

$$x_1 \cdot x_2 = \frac{c}{a} \Rightarrow -1 \cdot x_2 = \frac{c}{a} \Rightarrow x_2 = -\frac{c}{a}$$

Answer : D

Problem 4

$$\begin{cases} x\cdot 0.25 + y\cdot 0.10 + z\cdot 0.05 + u\cdot 0.01 = 0.45 \quad | :100 \\ x+y+z+u = 9 \end{cases}$$

$$\begin{cases} 25x + 10y + 5z + u = 45 \\ x+y+z+u = 9 \end{cases} \Rightarrow u \text{ should be divisible by } 5 \Rightarrow u = 0 \text{ or } u = 5$$

Case 1 $u = 0$