MAC 1140 Test 4 spring 2006 Answers.

(1) 4×3

(2) $\begin{bmatrix} -8 & 6 \\ -4 & 2 \end{bmatrix}$

(3) $\begin{bmatrix} -1 & 6 \\ -7 & -6 \end{bmatrix}$

(4) $\begin{bmatrix} 0 & 21 & -14 \\ -8 & 23 & -18 \end{bmatrix}$

(5) $-4(1) - 3(-2)$
$-4+6$
2

(6) Expand on Col. 3.
$0\begin{vmatrix} 3 & 2 \\ -4 & 5 \end{vmatrix} - 1\begin{vmatrix} 2 & -1 \\ -4 & 5 \end{vmatrix} + 2\begin{vmatrix} 2 & -1 \\ 3 & 2 \end{vmatrix}$
$0 - 1(10-4) + 2(4+3)$
$-1(6) + 2(7)$
$-6+14$
8

(7) $D = \begin{vmatrix} 3 & -4 \\ -5 & 3 \end{vmatrix} = 3\cdot 3 - (-4)(-5)$
$= 9 - 20$
$= -11$

$D_x = \begin{vmatrix} -4 & -4 \\ 2 & 3 \end{vmatrix} = -12 - (2)(-4)$
$= -12 + 8$
$= -4$

$D_y = \begin{vmatrix} 3 & -4 \\ -5 & 2 \end{vmatrix} = 6 - 20$
$= -14$

$x = \frac{D_x}{D} = \frac{-4}{-11} = \frac{4}{11}$

$y = \frac{D_y}{D} = \frac{-14}{-11} = \frac{14}{11}$

(8) $(1, 2, 0)$

(9) $(6, -1, -1)$

(10) No solution

(11) $-2x + 3y - z = -1$
$1x - 2y + z = 3$
$-x + y = 2$
$y = x + 2$

$x - 2(x+2) + z = 3$
$x - 2x - 4 + z = 3$
$-x - 4 + z = 3$
$z = 7 + x$

$\{(x, x+2, x+7) \mid x \text{ is real}\}$

(12) -(14) not on this test in fall 2006

Calculator Part:

(1) $(2, 0, 3)$

(2) $D = 8$

(3) $D_x = 50$

(4) $x = \frac{D_x}{D} = \frac{50}{8} = \frac{25}{4}$

(5) (a) com. diff = 4

(6) (c) $-1 + 4 - 9 + 16 - 25$

(b) -15

(7) $a_n = a_1 + (n-1)d$
$a_{41} = -5 + (41-1)\cdot 3$
$= -5 + (40)(3)$
$= -5 + 120$
$a_{41} = 115$

(8) $d = -3 - (-6) = 6 - 3 = \text{etc} = 3$

① Find value of n:
$a_n = a_1 + (n-1)d$
$291 = -6 + (n-1)(3)$
$291 = -6 + 3n - 3$
$291 = -9 + 3n$
$300 = 3n$
$100 = n$

② Sum:
$S_n = \frac{n}{2}(a_1 + a_n)$
$S_{100} = \frac{100}{2}(a_1 + a_{100})$
$S_{100} = 50(-6 + 291)$
$= 50(285)$
$S_{100} = 14{,}250$