

Soluție

1.a. Avem $D(-1) = \begin{vmatrix} 1 & 1 & -1 \\ 1 & -1 & 1 \\ -1 & 1 & 1 \end{vmatrix} = -1 - 1 - 1 + 1 - 1 - 1 = -4.$

b. Avem $D(a) = \begin{vmatrix} 1 & 1 & a \\ 1 & a & 1 \\ a & 1 & 1 \end{vmatrix} = a + a + a - a^3 - 1 - 1 = -a^3 + 3a - 2 = -(a-1)^2(a+2).$

c. Din $-(a-1)^2(a+2) = -4 \Leftrightarrow -(a+1)^2(a-2) = 0 \Leftrightarrow a = -1$ sau $a = 2.$

2.a. $x \circ y = xy - 10(x+y) + 110 = xy - 10x - 10y + 100 + 10 = x(y-10) - 10(y-10) + 10 = (x-10)(y-10) + 10.$

b. $C_{10}^1 \circ C_{20}^1 = (10-10)(20-10) + 10 = 10.$

c. $x \circ (x-1) = 10 \Leftrightarrow (x-10)(x-11) + 10 = 10 \Leftrightarrow (x-10)(x-11) = 0 \Leftrightarrow x = 10$ sau $x = 11.$