*the* determinant of the following matrices.

20. $\begin{vmatrix} 5 & 11 \\ -8 & -3 \end{vmatrix}$

$(5 \cdot -3 - 11 \cdot -8)$

$= (-15 - (-88)$

$= 73$

21. $\begin{vmatrix} -1 & 7 & 2 \\ 1 & 0 & -3 \\ -2 & 4 & 5 \end{vmatrix}$

$= 3$

(can do on calculator)

22. Solve for x. $\begin{vmatrix} 1 & x & 3 \\ 5 & -8 & 1 \\ x & 4 & 3 \end{vmatrix} = 54$

$54 = 1(-8 \cdot 3 - 4 \cdot 1) - x(5 \cdot 3 - x \cdot 1) + 3(5 \cdot 4 - (-8 \cdot x))$

$54 = (-24 - 4) - x(15 - x) + 3(20 - (-8x))$

$54 = -28 - 15x + x^2 + 3(20 + 8x)$

$54 = -28 - 15x + x^2 + 60 + 24x$

$54 = 32 + 9x + x^2$

$22 = 9x + x^2$

$x^2 + 9x - 22 = 0$

$(x + 11)(x - 2)$

$x = -11$ $x = 2$

both work separately

23. Find the area of the triangle with vertices A(1, 5), B(4, 6), C(7, 3).