

Calcolo di determinanti

calcola i determinanti delle seguenti matrici usando la definizione o le regole di Sarrus e Laplace

1	$\begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix}$	$\begin{pmatrix} 2 & 6 \\ -1 & 5 \end{pmatrix}$	-3, 16
2	$\begin{pmatrix} 0 & 3 \\ 0 & -2 \end{pmatrix}$	$\begin{pmatrix} 1 & 6 \\ 9 & -4 \end{pmatrix}$	0, -58
3	$\begin{pmatrix} 3 & -5 \\ 1 & 2 \end{pmatrix}$	$\begin{pmatrix} 0 & 11 \\ -7 & 0 \end{pmatrix}$	11, 77
4	$\begin{pmatrix} 7 & 5/2 \\ 14 & 5 \end{pmatrix}$	$\begin{pmatrix} -1 & 2 \\ 1 & -1 \end{pmatrix}$	0, -1
5	$\begin{pmatrix} 2 & 2^2 \\ 2^3 & 2^{-1} \end{pmatrix}$	$\begin{pmatrix} 2/3 & 12/7 \\ -2/5 & 7/8 \end{pmatrix}$	-31, $\frac{533}{420}$
6	$\begin{pmatrix} 1 & 0 \\ 5 & 3 \end{pmatrix}$	$\begin{pmatrix} 5 & 3 \\ 1 & 0 \end{pmatrix}$	3, -3 <i>(perchè sono opposti?)</i>
7	$\begin{pmatrix} 1/2 & 1/3 \\ -3 & -2 \end{pmatrix}$	$\begin{pmatrix} 1/\sqrt{2} & 0 \\ 7/3 & -1/\sqrt{2} \end{pmatrix}$	0, $-\frac{1}{2}$
8	$\begin{pmatrix} 5/4 & 18/7 \\ 2/9 & 8/7 \end{pmatrix}$	$\begin{pmatrix} \sqrt{2}/2 & 1/\sqrt{7} \\ -1 & \sqrt{14}/7 \end{pmatrix}$	$\frac{6}{7}$, $\frac{2\sqrt{7}}{7}$
9	$\begin{pmatrix} -2/3 & -4 \\ 0 & 3/16 \end{pmatrix}$	$\begin{pmatrix} \sqrt{3} & -\sqrt[3]{9} \\ -\sqrt[3]{3} & \sqrt{3} \end{pmatrix}$	$-\frac{1}{8}$, 0
10	$\begin{pmatrix} -\frac{5}{2} & -6 \\ \frac{1}{9} & \frac{2}{3} \end{pmatrix}$	$\begin{pmatrix} 3 & 5/2 \\ -3 & -3/2 \end{pmatrix}$	-1, 3
11	$\begin{pmatrix} -1 & -9/22 \\ 5/3 & -4/11 \end{pmatrix}$	$\begin{pmatrix} 1 - \sqrt{5}/2 & 1 + \sqrt{5} \\ 1 + \sqrt{5}/2 & 1 - \sqrt{5} \end{pmatrix}$	$\frac{23}{22}$, $-3\sqrt{5}$

12	$\begin{pmatrix} \sqrt{3}+1 & \sqrt{2}+1 \\ 3-\sqrt{2} & \sqrt{3}-2 \end{pmatrix}$	$\begin{pmatrix} a+1 & a+1 \\ a+2 & a+4 \end{pmatrix}$	$-(\sqrt{3}+2\sqrt{2}), 2(a+1)$
13	$\begin{pmatrix} 3/5 & 0 \\ 0 & 5/12 \end{pmatrix}$	$\begin{pmatrix} 0 & \sqrt{2}/3 \\ \sqrt{6} & 0 \end{pmatrix}$	$\frac{1}{4}, -\frac{2\sqrt{3}}{3}$
14	$\begin{pmatrix} \sin \frac{\pi}{4} & \cot \frac{4\pi}{3} \\ \cos \frac{5\pi}{4} & \tan \frac{5\pi}{6} \end{pmatrix}$	$\begin{pmatrix} 2-i & i \\ 2i & 1+i \end{pmatrix}$	$0, i+3$
15	$\begin{pmatrix} \sqrt{x-1} & x-2 \\ 1 & \sqrt{x-1} \end{pmatrix}$	$\begin{pmatrix} \sin x & \cos x \\ \sin x+1 & 1+\cos x \end{pmatrix}$	$1, \sin x - \cos x$
16	$\begin{pmatrix} 0 & 1 & 2 \\ 1 & 0 & 3 \\ 1 & 1 & 1 \end{pmatrix}$	$\begin{pmatrix} 3 & 2 & 1 \\ 1 & 2 & 1 \\ -3 & 4 & 3 \end{pmatrix}$	$4, 4$
17	$\begin{pmatrix} 1 & -4 & 3 \\ 5 & 0 & 0 \\ -1 & 0 & 2 \end{pmatrix}$	$\begin{pmatrix} 1 & 1/2 & 7 \\ -1 & -1/2 & 7 \\ 1 & 0 & 14 \end{pmatrix}$	$40, 7$
18	$\begin{pmatrix} 1 & 4 & 1 \\ 2 & 5 & -3 \\ -2 & 3 & 4 \end{pmatrix}$	$\begin{pmatrix} 12 & -9 & -17 \\ -4 & 3 & 5 \\ -10 & 8 & 15 \end{pmatrix}$	$-21, 4$
19	$\begin{pmatrix} 6 & -3 & 3 \\ 1 & 0 & 1 \\ -2 & 2 & 0 \end{pmatrix}$	$\begin{pmatrix} 2 & 5 & 2 \\ 1/4 & -2 & 7/4 \\ -1 & 3 & -1 \end{pmatrix}$	$0, -\frac{33}{2}$
20	$\begin{pmatrix} 18 & 4 & -1 \\ 1 & 0 & 0 \\ 2 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1/2 & 1 & 0 \\ 5/8 & 0 & -2/3 \\ 0 & 4 & 8 \end{pmatrix}$	$0, -\frac{11}{3}$
21	$\begin{pmatrix} 0 & -1 & 0 \\ 2 & 7 & 9 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 5/2 & -1/4 & 0 \\ -3/4 & -2 & 1/7 \\ 2/5 & 3/5 & 0 \end{pmatrix}$	$0, -\frac{8}{35}$

22	$\begin{pmatrix} 0 & 5 & 0 \\ 1 & -3 & 6 \\ 0 & 0 & 3 \end{pmatrix}$	$\begin{pmatrix} 12/7 & -5/4 & 0 \\ -1/5 & -2 & 2/7 \\ 0 & -1 & 3 \end{pmatrix}$	$-15, \quad -\frac{2067}{196}$
23	$\begin{pmatrix} 1 & 3 & -4 \\ -5 & 0 & 4 \\ 3 & 2 & -2 \end{pmatrix}$	$\begin{pmatrix} 0 & 1/3 & -2/9 \\ -1 & 0 & 0 \\ 7 & 5/6 & 2 \end{pmatrix}$	$38, \quad \frac{23}{27}$
24	$\begin{pmatrix} 0 & -1 & 0 \\ 5 & 0 & 2 \\ -1/4 & 3/7 & 1 \end{pmatrix}$	$\begin{pmatrix} -3 & 1/\sqrt{2} & 0 \\ 0 & \sqrt{2} & 1 \\ \sqrt{2} & -7 & 4/3 \end{pmatrix}$	$\frac{11}{2}, \quad -4(5 + \sqrt{2})$
25	$\begin{pmatrix} 2/5 & 0 & 6 \\ 0 & -4 & 4/7 \\ 5/8 & 13/4 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -3 & 1 \\ -\sqrt{7} & 1 & 9/2 \\ 2 & -\sqrt{7} & 0 \end{pmatrix}$	$\frac{499}{35}, \quad -22$
26	$\begin{pmatrix} -1 & 0 & 8 \\ 0 & 7/5 & -7/2 \\ 4/5 & -7/3 & 0 \end{pmatrix}$	$\begin{pmatrix} \sqrt{3}/5 & \sqrt{3} & -\sqrt{5} \\ 0 & -8 & 0 \\ -1 & 2/5 & 0 \end{pmatrix}$	$-\frac{119}{150}, \quad 8\sqrt{5}$

calcola i determinanti usando le proprietà del determinante e la regola di Laplace

27	$\begin{pmatrix} 0 & 9 & -1 & -2 \\ 1 & -1 & 3/4 & 3/2 \\ 1 & -1 & -3/4 & -3/2 \\ 7 & 0 & 1/\sqrt{2} & \sqrt{2} \end{pmatrix}$	0 <i>(perchè?)</i>
28	$\begin{pmatrix} 2 & 3 & 0 & 4 \\ 1 & 5 & 2 & -2 \\ 0 & 4 & 1 & 4 \\ 1 & 1 & 3 & 3 \end{pmatrix}$	38
29	$\begin{pmatrix} 1 & -2 & 4 & 3 \\ 4 & -3 & 9 & 5 \\ 3 & -1 & 5 & 2 \\ 7 & 4 & -5 & 8 \end{pmatrix}$	0

30	$\begin{pmatrix} -1 & 0 & -2 & 3 \\ 1 & 0 & -2 & 4 \\ -1 & 5 & 1 & 0 \\ 1 & 1 & 0 & 2 \end{pmatrix}$	-21
31	$\begin{pmatrix} 1 & 0 & 2 & -1 \\ 9 & 15 & 0 & 27 \\ 1 & -1 & 7 & 1 \\ 0 & -1 & 5 & 2 \end{pmatrix}$	0 (come mai?)
32	$\begin{pmatrix} 0 & 1 & 0 & 2 \\ 8 & 0 & -5 & 0 \\ 0 & 7 & 0 & -1 \\ 3 & 0 & -2 & 0 \end{pmatrix}$	15
33	$\begin{pmatrix} 4 & 3 & 2 & 1 \\ 1 & 2 & 3 & 4 \\ -1 & -4 & 2 & 2 \\ 8 & 6 & 4 & 2 \end{pmatrix}$	0
34	$\begin{pmatrix} 6 & 5 & -2 & -3 \\ 1 & 1 & 1 & 1 \\ \frac{3}{2} & 0 & 3 & 2 \\ 4 & 1 & 0 & \frac{2}{3} \end{pmatrix}$	33
35	$\begin{pmatrix} 2 & 1 & -3 & 11 \\ 0 & -7 & 21 & 2 \\ 5 & 2 & -6 & 7 \\ 12 & \frac{1}{3} & -1 & 0 \end{pmatrix}$	0 (come mai?)
36	$\begin{pmatrix} 0 & 30 & 0 & -75 \\ 1 & 2 & 2 & -4 \\ 0 & 45 & 0 & -120 \\ 7 & 59 & -1 & -148 \end{pmatrix}$	3375
37	$\begin{pmatrix} 4 & 7 & 1 & 2 \\ -5 & 3 & 0 & 5 \\ 8 & 0 & -1 & \frac{9}{7} \\ -6 & 13 & 1 & 12 \end{pmatrix}$	0 (come mai?)

38	$\begin{pmatrix} -3 & 0 & 0 & 0 \\ -4 & 0 & 7 & -5 \\ -7 & -3 & -3 & -5 \\ 5 & 9 & -1 & 8 \end{pmatrix}$	891
39	$\begin{pmatrix} 7 & -9 & 9 & 1 \\ -9 & 0 & -4 & 7 \\ 6 & -5 & 2 & 0 \\ 0 & 6 & -9 & 1 \end{pmatrix}$	1243
40	$\begin{pmatrix} -8 & -10 & 0 & -3 \\ -8 & 0 & 0 & -7 \\ 4 & 4 & 0 & -2 \\ 9 & -3 & 0 & 4 \end{pmatrix}$	0
41	$\begin{pmatrix} 0 & -2 & 3 & 0 \\ 7 & -2 & 5 & 7 \\ 10 & -10 & 5 & 0 \\ 0 & 9 & -7 & -1 \end{pmatrix}$	1090
42	$\begin{pmatrix} -4 & -5 & 0 & -3 \\ -6 & -5 & 1 & -5 \\ 0 & 1 & 0 & 2 \\ 0 & 3 & 6 & -10 \end{pmatrix}$	68
43	$\begin{pmatrix} -6 & 3 & 0 & -4 \\ 7 & -4 & -5 & -5 \\ -8 & 0 & 5 & 3 \\ 0 & 5 & -10 & 0 \end{pmatrix}$	2370
44	$\begin{pmatrix} -1 & -12 & 9 & -5 \\ 0 & -9 & -5 & 0 \\ 0 & 0 & 9 & -8 \\ 0 & 1 & -1 & -7 \end{pmatrix}$	-679

45	$\begin{pmatrix} 11/7 & 7/9 & 1 & 4/9 \\ -17/14 & -1 & -1/2 & -1 \\ 1/7 & 0 & 0 & 0 \\ 41/11 & 7/6 & 3/2 & 7/6 \end{pmatrix}$	$\frac{11}{252}$
46	$\begin{pmatrix} 5 & -1 & 7 & -9 \\ 2 & -3 & -2 & -1 \\ 4 & 0 & 3 & -5 \\ -4 & 1 & -6 & 8 \end{pmatrix}$	23
47	$\begin{pmatrix} 7/51 & -8/15 & 8/51 & 46/255 \\ -3/17 & 5/12 & -1 & -27/45 \\ 0 & -1/2 & 0 & -2/5 \\ 0 & 0 & 0 & -1/5 \end{pmatrix}$	$\frac{19}{1734}$
48	$\begin{pmatrix} 0 & 5/13 & 1/9 & 7/5 \\ 0 & 1/2 & 0 & 1/6 \\ 0 & 1/4 & 0 & -1/12 \\ -1 & 2 & 0 & 1 \end{pmatrix}$	$\frac{1}{108}$
49	$\begin{pmatrix} -1,5 & 1,2 & -8,1 & 4,6 \\ 5,1 & -6,2 & 7,3 & -9,8 \\ -9,4 & 3,5 & 9,4 & -5,5 \\ -3,7 & -1,1 & -12,2 & 1,1 \end{pmatrix}$	$\cong 3,9086$

calcola il valore di a per il quale la matrice ha determinante nullo

50	$\begin{pmatrix} a & 1-a \\ 3 & 2 \end{pmatrix}$	$a = \frac{3}{5}$
51	$\begin{pmatrix} 2a-1 & a+1 \\ a-2 & 3a+2 \end{pmatrix}$	$a_1 = -\frac{2}{5} ; a_2 = 0$
52	$\begin{pmatrix} a^2 + a + 1 & a \\ a^2 + a - 1 & a - 1 \end{pmatrix}$	nessun valore