Info

This note, that was found here, as a part of a collection
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$$\cos\left(\pi\frac{p}{q}\right)$$

[1]

```
from sympy import cos, pi, nsimplify, sqrt

for q in range(1,100):
    print("|", q,"|", cos(pi/q),"|", cos(pi*2/q),"|")
```

q	$\cos\left(\frac{\pi}{q}\right)$	$\cos\left(\frac{2\pi}{q}\right)$
1	-1	1
2	0	-1
3	1/2	-1/2
4	sqrt(2)/2	0
5	1/4 + sqrt(5)/4	-1/4 + sqrt(5)/4
6	sqrt(3)/2	1/2
7	cos(pi/7)	cos(2*pi/7)
8	sqrt(sqrt(2)/4 + 1/2)	sqrt(2)/2
9	cos(pi/9)	cos(2*pi/9)
10	sqrt(sqrt(5)/8 + 5/8)	1/4 + sqrt(5)/4
11	cos(pi/11)	cos(2*pi/11)
12	sqrt(2)/4 + sqrt(6)/4	sqrt(3)/2
13	cos(pi/13)	cos(2*pi/13)
14	cos(pi/14)	cos(pi/7)
15	-1/8 + sqrt(5)/8 + sqrt(3)*sqrt(sqrt(5)/8 + 5/8)/2	1/8 + sqrt(5)/8 + sqrt(3)*sqrt(5/8 - sqrt(5)/8)/2
16	cos(pi/16)	sqrt(sqrt(2)/4 + 1/2)
17	cos(pi/17)	cos(2*pi/17)
18	cos(pi/18)	cos(pi/9)
19	cos(pi/19)	cos(2*pi/19)
20	sqrt(2)*sqrt(5/8 - sqrt(5)/8)/2 + sqrt(2)*(1/4 + sqrt(5)/4)/2	sqrt(sqrt(5)/8 + 5/8)
21	cos(pi/21)	cos(2*pi/21)
22	cos(pi/22)	cos(pi/11)
23	cos(pi/23)	cos(2*pi/23)
24	sqrt(1/2 - sqrt(2)/4)/2 + sqrt(3)*sqrt(sqrt(2)/4 + 1/2)/2	sqrt(2)/4 + sqrt(6)/4
25	cos(pi/25)	cos(2*pi/25)
26	cos(pi/26)	cos(pi/13)
27	cos(pi/27)	cos(2*pi/27)
28	cos(pi/28)	cos(pi/14)
29	cos(pi/29)	cos(2*pi/29)
30	sqrt(5/8 - sqrt(5)/8)/2 + sqrt(3)*(1/4 + sqrt(5)/4)/2	-1/8 + sqrt(5)/8 + sqrt(3)*sqrt(sqrt(5)/8 + 5/8)/2
31	cos(pi/31)	cos(2*pi/31)
32	cos(pi/32)	cos(pi/16)
33	cos(pi/33)	cos(2*pi/33)
34	cos(pi/34)	cos(pi/17)
35	cos(pi/35)	cos(2*pi/35)
36	cos(pi/36)	cos(pi/18)
37	cos(pi/37)	cos(2*pi/37)
38	cos(pi/38)	cos(pi/19)
39	cos(pi/39)	cos(2*pi/39)
40	(-1/4 + sqrt(5)/4)*sqrt(1/2 - sqrt(2)/4) + sqrt(sqrt(2)/4 + 1/2)*sqrt(sqrt(5)/8 + 5/8)	sqrt(2)*sqrt(5/8 - sqrt(5)/8)/2 + sqrt(2)*(1/4 + sqrt(5)/4)/2
41	cos(pi/41)	cos(2*pi/41)
42	cos(pi/42)	cos(pi/21)
43	cos(pi/43)	cos(2*pi/43)
44	cos(pi/44)	cos(pi/22)
45	cos(pi/45)	cos(2*pi/45)
46	cos(pi/46)	cos(pi/23)
47	cos(pi/47)	cos(2*pi/47)
48	cos(pi/48)	sqrt(1/2 - sqrt(2)/4)/2 + sqrt(3)*sqrt(sqrt(2)/4 + 1/2)/2
49	cos(pi/49)	cos(2*pi/49)
50	cos(pi/50)	cos(pi/25)
51	cos(pi/51)	cos(2*pi/51)
52	cos(pi/52)	cos(pi/26)
53	cos(pi/53)	cos(2*pi/53)

q	$\cos\left(\frac{\pi}{q}\right)$	$\cos\left(\frac{2\pi}{q}\right)$
54	cos(pi/54)	cos(pi/27)
55	cos(pi/55)	cos(2*pi/55)
56	cos(pi/56)	cos(pi/28)
57	cos(pi/57)	cos(2*pi/57)
58	cos(pi/58)	cos(pi/29)
59	cos(pi/59)	cos(2*pi/59)
60	(-sqrt(2)*sqrt(5/8 - sqrt(5)/8)/2 + sqrt(2)*(1/4 + sqrt(5)/4)/2)*(-sqrt(5)/8 - 1/8 + sqrt(3)*sqrt(5/8 - sqrt(5)/8)/2) + (sqrt(2)*sqrt(5/8 - sqrt(5)/8)/2 + sqrt(2)*(1/4 + sqrt(5)/4)/2)*(sqrt(5/8 - sqrt(5)/8)/2 + sqrt(3)*(1/4 + sqrt(5)/4)/2)	sqrt(5/8 - sqrt(5)/8)/2 + sqrt(3)*(1/4 + sqrt(5)/4)/2
61	cos(pi/61)	cos(2*pi/61)
62	cos(pi/62)	cos(pi/31)
63	cos(pi/63)	cos(2*pi/63)
64	cos(pi/64)	cos(pi/32)
65	cos(pi/65)	cos(2*pi/65)
66	cos(pi/66)	cos(pi/33)
67	cos(pi/67)	cos(2*pi/67)
68	cos(pi/68)	cos(pi/34)
69	cos(pi/69)	cos(2*pi/69)
70	cos(pi/70)	cos(pi/35)
71	cos(pi/71)	cos(2*pi/71)
72	cos(pi/72)	cos(pi/36)
73	cos(pi/73)	cos(2*pi/73)
74	cos(pi/74)	cos(pi/37)
75	cos(pi/75)	cos(2*pi/75)
76	cos(pi/76)	cos(pi/38)
77	cos(pi/77)	cos(2*pi/77)
78	cos(pi/78)	cos(pi/39)
79	cos(pi/79)	cos(2*pi/79)
80	cos(pi/80)	(-1/4 + sqrt(5)/4)*sqrt(1/2 - sqrt(2)/4) + sqrt(sqrt(2)/4 + 1/2)*sqrt(sqrt(5)/8 + 5/8)
81	cos(pi/81)	cos(2*pi/81)
82	cos(pi/82)	cos(pi/41)
83	cos(pi/83)	cos(2*pi/83)
84	cos(pi/84)	cos(pi/42)
85	cos(pi/85)	cos(2*pi/85)
86	cos(pi/86)	cos(pi/43)
87	cos(pi/87)	cos(2*pi/87)
88	cos(pi/88)	cos(pi/44)
89	cos(pi/89)	cos(2*pi/89)
90	cos(pi/90)	cos(pi/45)
91	cos(pi/91)	cos(2*pi/91)
92	cos(pi/92)	cos(pi/46)
93	cos(pi/93)	cos(2*pi/93)
94	cos(pi/94)	cos(pi/47)
95	cos(pi/95)	cos(2*pi/95)
96	cos(pi/96)	cos(pi/48)
97	cos(pi/97)	cos(2*pi/97)
98	cos(pi/98)	cos(pi/49)
99	cos(pi/99)	cos(2*pi/99)

Current note has 0 direct children and 0 total descendants.

- squishy
  - pow
    - $\cos\left(\pi\frac{p}{q}\right)$

And it has 28 siblings.

- squishy
  - pow
    - Angle function
    - Bessel functions
    - $\cos\sqrt{z}$
    - The complex logarithm
    - $\sum_{n\geq 0} z^{n!}$
    - $z^3 - 3z$
    - $\frac{r_0}{1+\epsilon\cos b\theta}$
    - $\cos\left(\pi\frac{p}{q}\right)$
    - $\frac{\cos x^k}{x}$
    - Elliptic integrals and Jacobi elliptic functions
    - The complex exponential $\exp(z)$
    - $\exp\left(\frac{z+1}{z-1}\right)$

- e^{-x^2}
- [Only sum terms that are multiples of N in $\mathbb{C}[[z](https://rupadarshiray.github.io/notes/YchnxQ9SF1RsuKjBntMv8a.)]]$
- $\int \frac{1}{x^2+bx+c}$
- $\frac{\exp(z)}{1-z}$
- $\sin x$
- $\sin(x \sin(x))$
- $\frac{\sin x}{x}$
- stock.sin x by xk
- $\sin x^2$
- $\sqrt{z}$
- $\sqrt{z^2-1}$
- Theta functions
- Weierstrass elliptic function $\wp$
- Weierstrass' primary factors
- $x^2 \sin \frac{1}{x}$
- $x + x^2 \sin \frac{1}{x}$

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1. algebra precalculus - Cool way of finding $\cos\left(\frac{\pi}{5}\right)$ - Mathematics Stack Exchange ↩