25 | 213

6/23 - 27

Alon Amit	1/24
Paul Pancstep	3/14
Linda Green	4/11
Rebecca Garcia	5/9

$\pi = 11.001001011111011010100010\ldots$

π in base -8:

$3.11037552421026 4$

$\downarrow$

$11.001001\ 000\ 011111\ 101\ 101$

1 $\frac{1}{8}$ $\frac{1}{8^2}$ $\frac{1}{8^3}$ $\frac{1}{8^4}$ $\frac{1}{8^5}$

3. 11037 base 8

3. 14159 base 10

1 4

$\frac{1}{10}$ $\frac{1}{10^2}$

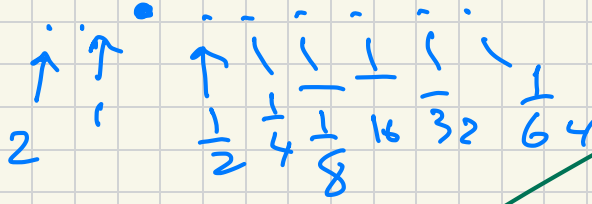
3. 14 in base -10

$= 3\times 1 + 1\times\frac{1}{10} + 4\times\frac{1}{10^2} + 1\times\frac{1}{10^3}$

$3 + \frac{1}{8} + \frac{1}{64} + \frac{3}{8^4} + \frac{7}{8^5}$

$$\pi = 3 + \frac{1}{8} + \frac{1}{64} + \frac{3}{8^4} + \frac{7}{8^5}$$

$$11.001001_2$$



$$3 + \frac{1}{8} + \frac{1}{64} + \frac{0}{8^3} + \frac{3}{8^4}$$

$$1 \cdot 2^1 + 1 + \frac{1}{2^3} + \frac{0}{2^4} + \frac{0}{2^5} + \frac{1}{2^6} + \frac{0}{2^9} + \frac{3}{2^{12}}$$

$$\frac{3}{2^{12}} = \frac{2+1}{2^{12}} = \frac{2}{2^{12}} + \frac{1}{2^{12}}$$

$$= \frac{1}{2^{11}} + \frac{1}{2^{12}}$$

binary 0 1 1

base 8 octal 3

$$\frac{3}{8^4} = \frac{0\cdot 2^2 + 1\cdot 2^1 + 1\cdot 2^0}{8^{12}}$$

$$\frac{0}{2^{10}} + \frac{1}{2^{11}} + \frac{1}{2^{12}}$$

$5.107364_{\text{base } 8}$

$= 101.001000111011110000$ ☺

$5 * 1 + \frac{1}{8} + \frac{0}{8^2} + \frac{7}{8^3}$

001

$\frac{1}{2^1} \; \frac{1}{2^2} \; \frac{1}{2^3}$

$\frac{0}{2^6}$

$\frac{0}{2^4} + \frac{0}{2^5} + \frac{0}{2^6}$

$\frac{7}{2^9}$

$\frac{1}{2^7} + \frac{1}{2^8} + \frac{1}{2^9}$

March 7, 2015

3. 7. 15 $= \pi$-day

$\pi = 3 +$ stuff

aliquot

$3 + \frac{1}{8} < \pi < 3 + \frac{1}{7}$

$\pi = 3 + \cfrac{1}{7 + \cfrac{\quad}{\quad}}$

$$\pi = 3 + \cfrac{1}{7 + \cfrac{1}{15 + \cfrac{1}{1 + \cfrac{1}{292 + \cdots}}}} \qquad \pi \approx 3 + \cfrac{1}{7 + \cfrac{1}{15}}$$

$\pi = 3.14159265\ldots$ $\qquad \pi = [3; 7, 15, 1, 292, \ldots]$

$\pi = 3 + .14159265\ldots$

$= 3 + \cfrac{1}{\cfrac{1}{.14159265\ldots}} = 3 + \cfrac{1}{7.0625133306}$

$\pi = 3 + \cfrac{1}{7 + \cfrac{1}{\cfrac{1}{.062513\ldots}}} = 3 + \cfrac{1}{7 + \cfrac{1}{15.996\ldots}}$

$$\frac{10}{7} = 1 + \frac{3}{7}$$

$$= 1 + \frac{1}{\frac{7}{3}}$$

$$= 1 + \frac{1}{2 + \frac{1}{3}} = [1; 2, 3]$$

$$\sqrt{2} =$$

$$a + \cfrac{1}{b + \cfrac{1}{c + \cfrac{1}{d + \cdots}}}$$

$$[a; b, c, d, \ldots]$$

$\sqrt{2} = 1.41435 = 1 + .414\ldots$

$= 1 + \cfrac{1}{\cfrac{1}{.414\ldots}}$

$\sqrt{2} = [1; 2, 2, \ldots]$

$[1; \overline{2}]$

$= 1 + \cfrac{1}{2.414\ldots}$

$= 1 + \cfrac{1}{2 + .414\ldots}$

$= 1 + \cfrac{1}{2 + \cfrac{1}{2.414\ldots}}$

$$\sqrt{2} = 1 + \sqrt{2} - 1$$

$$= 1 + \frac{1}{\frac{1}{\sqrt{2}-1}} \qquad \frac{\sqrt{2}+1}{\sqrt{2}+1}$$

$$\sqrt{2} = 1 + \frac{1}{\sqrt{2}+1}$$

$$= 1 + \frac{1}{2 + \sqrt{2} - 1}$$

$$= 1 + \frac{1}{2 + \frac{1}{\sqrt{2}+1}}$$

$$x = \sqrt{2}$$

$$x^2 = 2$$

$$x^2 - 1 = 2 - 1 = 1$$

$$(x+1)(x-1) = 1$$

$$x - 1 = \frac{1}{x+1} = x - 1 = \frac{1}{1+x}$$

Golden Ratio

$$\phi = \frac{1+\sqrt{5}}{2}$$

$$\phi^2 = \phi + 1$$

$$\phi = 1 + \phi - 1$$

$$\phi^2 = \phi + 1$$

$$\phi^2 - 1 = \phi$$

$$(\phi - 1)(\phi + 1) = \phi$$

$$\frac{\phi}{\phi - 1} = \phi + 1$$

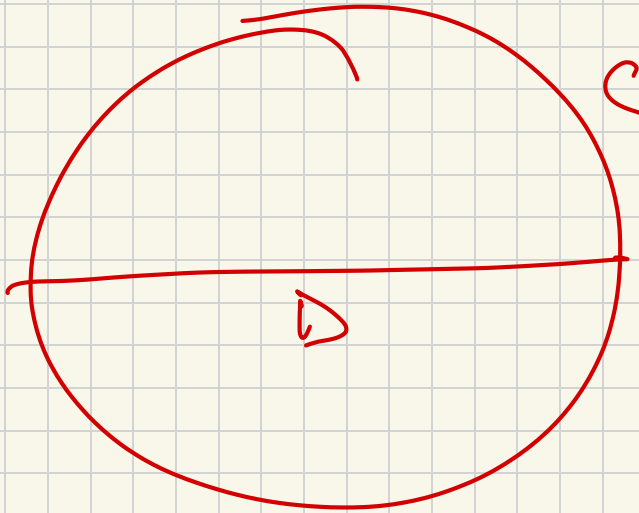
$$\frac{1}{\phi - 1} = 1 + \frac{1}{\phi}$$

$$\phi = 1 + \frac{1}{\phi - 1}$$

$$\phi - 1 = \frac{1}{\frac{1}{\phi - 1}}$$

$$= \frac{1}{1 + \frac{1}{\phi}}$$

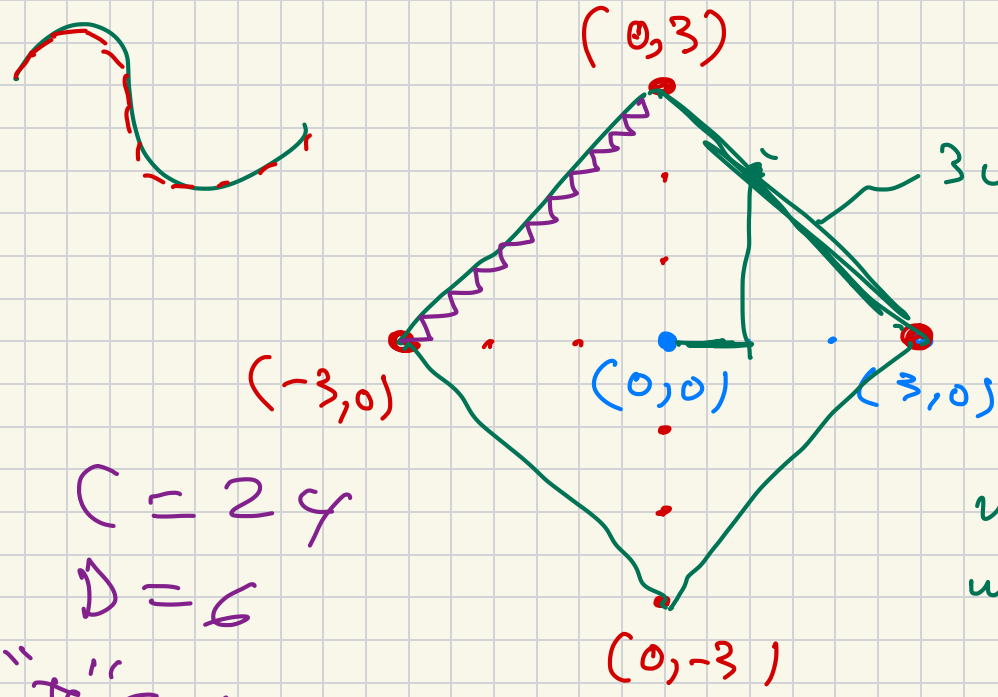
π = Ratio of circ to diam



$$\pi := \frac{C}{D}$$

What if dist was "Taxicab"

"Circle" of Radius 3 in taxicab land



$C = 24$

$D = 6$

"π" $= 4$

what is diam? 6

what is circum

Happy $\frac{211}{512}$ Day!

$211 = \underline{128} + 83$

$128 + 64 + 19$

$16 + 3$

$\frac{211}{512} = 0\,1\,1\,0\,1\,0\,0\,1\,1 = .0\,1\,1\,0\,1\,0\,0\,1\,1$

128 64 32 16 8 4 2 1

0	1	1
0	1	0
0	1	1