





In[*]:=  **FOR THE pLANETARY yEARS** » 
 planets PLANETS [ orbital period]

Out[*]:= { 87.96926 days , 224.70080 days , 365.25636 days ,
 1.8808476 a , 11.862615 a , 29.447498 a , 84.016846 a , 164.79132 a }

In[77]:= **planetaryyears =**
List[88, 224.7, 27.3, 365.2, 687, 1682, 4332.59, 10759, 30687, 60190, 90560, 203416]

Out[77]:= {88, 224.7, 27.3, 365.2, 687, 1682, 4332.59, 10759, 30687, 60190, 90560, 203416}

In[78]:= **yrfreqsec = 60 * 60 * 24 * planetaryyears**

Out[78]:= { 7603200, 1.94141 × 10⁷, 2.35872 × 10⁶, 3.15533 × 10⁷, 59356800, 145324800,
 3.74336 × 10⁸, 929577600, 2651356800, 5200416000, 7824384000, 17575142400 }

In[79]:= **yrfreqo = 1 / yrfreqsec**

Out[79]:= { $\frac{1}{7603200}$, 5.1509 × 10⁻⁸, 4.23959 × 10⁻⁷, 3.16924 × 10⁻⁸, $\frac{1}{59356800}$, $\frac{1}{145324800}$,
 2.6714 × 10⁻⁹, $\frac{1}{929577600}$, $\frac{1}{2651356800}$, $\frac{1}{5200416000}$, $\frac{1}{7824384000}$, $\frac{1}{17575142400}$ }

In[80]:= **yearfreq = 1 / planetaryyears**

Out[80]:= { $\frac{1}{88}$, 0.00445038, 0.03663, 0.00273823, $\frac{1}{687}$,
 $\frac{1}{1682}$, 0.000230809, $\frac{1}{10759}$, $\frac{1}{30687}$, $\frac{1}{60190}$, $\frac{1}{90560}$, $\frac{1}{203416}$ }

In[81]:= **yearfrequencymunum = N[2^FractionalPart[Log[2, yrfreqo]]] * 2**

Out[81]:= { 1.1033, 1.72836, 1.77821, 1.06342, 1.1306,
 1.84714, 1.4342, 1.15509, 1.61991, 1.65178, 1.09784, 1.95502 }

In[82]:= **freqyrlist = yearfrequencymunum * 512**

Out[82]:= { 564.889, 884.918, 910.444, 544.472, 578.868,
 945.736, 734.308, 591.404, 829.395, 845.711, 562.095, 1000.97 }

In[83]:= **N[yearfreq] * 1024**

Out[83]:= { 11.6364, 4.55719, 37.5092, 2.80394, 1.49054, 0.608799,
 0.236348, 0.0951761, 0.0333692, 0.0170128, 0.0113074, 0.00503402 }

In[84]:= **N[yearfreq]**

Out[84]:= { 0.0113636, 0.00445038, 0.03663, 0.00273823, 0.0014556, 0.00059453, 0.000230809,
 0.0000929454, 0.0000325871, 0.0000166141, 0.0000110424, 4.91603 × 10⁻⁶ }

In[85]:= *** 256**



$$\text{In[85]}:= \text{mercrtfreqyear} = \text{yrfreq} / \left(\frac{1}{(88 * 24 * 60 * 60)} \right)$$

$$\text{Out[85]}= \left\{ 1, 0.391633, 3.22344, 0.240964, \frac{88}{687}, \frac{44}{841}, 0.0203112, \frac{88}{10759}, \frac{88}{30687}, \frac{44}{30095}, \frac{11}{11320}, \frac{11}{25427} \right\}$$

$$\text{In[86]}:= \mathbf{N[2^{\text{FractionalPart}[\text{Log}[2, \text{mercrtfreqyear} * 1024 * 8]]}]}$$

$$\text{Out[86]}= \{1., 1.56653, 1.61172, 1.92771, 1.02475, 1.6742, 1.29992, 1.04694, 1.46824, 1.49713, 1.99011, 1.77197\}$$

$$\text{In[87]}:= \text{mercrootyear} = \text{yearfreq} / \left(\frac{1}{88} \right)$$

$$\text{Out[87]}= \left\{ 1, 0.391633, 3.22344, 0.240964, \frac{88}{687}, \frac{44}{841}, 0.0203112, \frac{88}{10759}, \frac{88}{30687}, \frac{44}{30095}, \frac{11}{11320}, \frac{11}{25427} \right\}$$

$$\text{In[88]}:= \mathbf{N[2^{\text{FractionalPart}[\text{Log}[2, \text{mercrootyear} * 1024 * 8]]}]}$$

$$\text{Out[88]}= \{1., 1.56653, 1.61172, 1.92771, 1.02475, 1.6742, 1.29992, 1.04694, 1.46824, 1.49713, 1.99011, 1.77197\}$$

$$\text{In[89]}:= \text{venusrootyear} = \text{yearfreq} / 0.004450378282153983^{\wedge}$$

$$\text{Out[89]}= \{2.55341, 1., 8.23077, 0.615279, 0.327074, 0.133591, 0.0518627, 0.0208848, 0.00732232, 0.00373318, 0.00248123, 0.00110463\}$$

$$\text{In[90]}:= \mathbf{N[2^{\text{FractionalPart}[\text{Log}[2, \text{venusrootyear} * 1024 * 8]]}]}$$

$$\text{Out[90]}= \{1.2767, 1., 1.02885, 1.23056, 1.3083, 1.06873, 1.65961, 1.33663, 1.87451, 1.91139, 1.27039, 1.13114\}$$

$$\text{In[91]}:= \text{moonrootyear} = \text{yearfreq} / 0.03663003663003663^{\wedge}$$

$$\text{Out[91]}= \{0.310227, 0.121495, 1., 0.0747536, 0.039738, 0.0162307, 0.00630108, 0.00253741, 0.000889628, 0.000453564, 0.000301458, 0.000134208\}$$

$$\text{In[92]}:= \mathbf{N[2^{\text{FractionalPart}[\text{Log}[2, \text{moonrootyear} * 1024 * 8]]}]}$$

$$\text{Out[92]}= \{1.24091, 1.94393, 1., 1.19606, 1.27162, 1.03876, 1.61308, 1.29915, 1.82196, 1.8578, 1.23477, 1.09943\}$$

$$\text{In[93]}:= \text{earthrootyear} = \text{yearfreq} / 0.002738225629791895^{\wedge}$$

$$\text{Out[93]}= \{4.15, 1.62528, 13.3773, 1., 0.531587, 0.217122, 0.0842914, 0.0339437, 0.0119008, 0.00606745, 0.00403269, 0.00179534\}$$

$$\text{In[94]}:= \mathbf{N[2^{\text{FractionalPart}[\text{Log}[2, \text{earthrootyear} * 1024 * 8]]}]}$$

$$\text{Out[94]}= \{1.0375, 1.62528, 1.67216, 1., 1.06317, 1.73698, 1.34866, 1.0862, 1.5233, 1.55327, 1.03237, 1.83842\}$$

$$\text{In[95]}:= \text{marsrootyear} = \text{yearfreq} / \left(\frac{1}{687} \right)$$

$$\text{Out[95]}= \left\{ \frac{687}{88}, 3.05741, 25.1648, 1.88116, 1, \frac{687}{1682}, 0.158566, \frac{687}{10759}, \frac{229}{10229}, \frac{687}{60190}, \frac{687}{90560}, \frac{687}{203416} \right\}$$

In[96]:= **N[2^{FractionalPart[Log[2, marsrootyear * 1024 * 8]]]}**

Out[96]:= {1.9517, 1.5287, 1.5728, 1.88116, 1., 1.63377,
1.26853, 1.02166, 1.43279, 1.46097, 1.94205, 1.72919}

In[97]:= **ceresrootyear = yearfreq / $\left(\frac{1}{1682}\right)$**

Out[97]:= $\left\{\frac{841}{44}, 7.48554, 61.6117, 4.6057, \frac{1682}{687}, 1, 0.38822, \frac{58}{371}, \frac{1682}{30687}, \frac{841}{30095}, \frac{841}{45280}, \frac{841}{101708}\right\}$

In[98]:= **N[2^{FractionalPart[Log[2, ceresrootyear * 1024 * 8]]]}**

Out[98]:= {1.1946, 1.87138, 1.92537, 1.15142, 1.22416,
1., 1.55288, 1.25067, 1.75397, 1.78847, 1.18869, 1.0584}

In[99]:= **jupiterrootyear = yearfreq / $\left(\frac{1}{4332.59}\right)$**

Out[99]:= {49.234, 19.2817, 158.703, 11.8636, 6.30654, 2.57586,
1., 0.402694, 0.141186, 0.0719819, 0.0478422, 0.0212992}

In[100]:= **N[2^{FractionalPart[Log[2, jupiterrootyear * 1024 * 8]]]}**

Out[100]:= {1.53856, 1.2051, 1.23987, 1.48295, 1.57663,
1.28793, 1., 1.61078, 1.12949, 1.15171, 1.53095, 1.36315}

In[101]:= **saturnrootyear = yearfreq / $\left(\frac{1}{10759}\right)$**

Out[101]:= $\left\{\frac{10759}{88}, 47.8816, 394.103, 29.4606, \frac{10759}{687}, \frac{371}{58}, 2.48327, 1, \frac{203}{579}, \frac{10759}{60190}, \frac{10759}{90560}, \frac{10759}{203416}\right\}$

In[102]:= **N[2^{FractionalPart[Log[2, saturnrootyear * 1024 * 8]]]}**

Out[102]:= {1.91033, 1.4963, 1.53946, 1.84129, 1.95761,
1.59914, 1.24164, 1., 1.40242, 1.43, 1.90088, 1.69253}

In[103]:= **uranusrootyear = yearfreq / $\left(\frac{1}{30687}\right)$**

Out[103]:= $\left\{\frac{30687}{88}, 136.569, 1124.07, 84.0279, \frac{10229}{229}, \frac{30687}{1682}, 7.08283, \frac{579}{203}, 1, \frac{30687}{60190}, \frac{30687}{90560}, \frac{30687}{203416}\right\}$

In[104]:= **N[2^{FractionalPart[Log[2, uranusrootyear * 1024 * 8]]]}**

Out[104]:= {1.36217, 1.06694, 1.09772, 1.31294, 1.39588,
1.14027, 1.77071, 1.42611, 1., 1.01967, 1.35543, 1.20687}

In[105]:= **neptunerootyear = yearfreq / $\left(\frac{1}{60190}\right)$**

Out[105]:= $\left\{\frac{30095}{44}, 267.868, 2204.76, 164.814, \frac{60190}{687}, \frac{30095}{841}, 13.8924, \frac{60190}{10759}, \frac{60190}{30687}, 1, \frac{6019}{9056}, \frac{30095}{101708}\right\}$

In[106]:= **N[2^FractionalPart[Log[2, neptunerootyear * 1024 * 8]]]**

Out[106]:= {1.33589, 1.04636, 1.07654, 1.28761, 1.36895,
1.11827, 1.73655, 1.3986, 1.96142, 1., 1.32928, 1.18358}

In[107]:= **plutorootyear = yearfreq / ($\frac{1}{90560}$)**

Out[107]:= { $\frac{11320}{11}$, 403.026, 3317.22, 247.974, $\frac{90560}{687}$, $\frac{45280}{841}$, 20.902, $\frac{90560}{10759}$, $\frac{90560}{30687}$, $\frac{9056}{6019}$, 1, $\frac{11320}{25427}$ }

In[108]:= **N[2^FractionalPart[Log[2, plutorootyear * 1024 * 8]]]**

Out[108]:= {1.00497, 1.57432, 1.61973, 1.93729, 1.02984,
1.68252, 1.30638, 1.05214, 1.47554, 1.50457, 1., 1.78078}

In[109]:= **erisrootyear = yearfreq / ($\frac{1}{203416}$)**

Out[109]:= { $\frac{25427}{11}$, 905.278, 7451.14, 556.999, $\frac{203416}{687}$,
 $\frac{101708}{841}$, 46.9502, $\frac{203416}{10759}$, $\frac{203416}{30687}$, $\frac{101708}{30095}$, $\frac{25427}{11320}$, 1 }

In[110]:= **N[2^FractionalPart[Log[2, erisrootyear * 1024 * 8]]]**

Out[110]:= {1.12868, 1.76812, 1.81912, 1.08789, 1.15661,
1.88964, 1.46719, 1.18166, 1.65718, 1.68978, 1.1231, 1.}