(18) MOON PERIGEE (MIN)
MIN = 363,000 KM
APOGEE (MAX)
MAX = 406,000 KM

MAX = 27.3 days JAN 2

MAX − 2 cos(x − 2)

B = 27.3 $\frac{2\pi}{27.3}$

$\cos\left(\frac{2\pi}{27.3}t\right) = \frac{\pi}{2} \times \frac{27.3}{2\pi} = \frac{27.3\pi}{4\pi}$

$\cos\left(\frac{2\pi}{27.3}t\right) = 6,825$

(1,0)(6,825,0)

AMP = $\frac{406 - 363}{2} = \frac{43}{2} = 21.5 \times 10^3$

MID = 406 000 − 21500 =

MID = 384 500   1:2·1

~~$21500\cos\left(\frac{2\pi}{27.3}(t-2)\right) + 384500$~~

$21500\cos\left(\frac{2\pi}{27.3}(t-2)\right) + 384500$

174

P = 365 days = 1 YEAR

JAN 7 = MAX 29°C

~~MIN 14°C~~
MIN 14°C

AMP = $\frac{29-14}{2} = \frac{15}{2} = 7.5$

JAN 7 → t − 7

P = $\frac{2\pi}{365}$ $\cos\left(\frac{2\pi}{365}\right) = \frac{\pi}{2} \times \frac{365}{2\pi}$

$7.5\cos\left(\frac{2\pi}{365}(t-7)\right)$: (6,0) (91.25,0)

MID = 29 − 7.5 = 21.5

~~$7.5\cos\left(\frac{2\pi}{365}(t-7)\right) + 21.5$~~

MID = 14C ~~MAX = 29~~

~~AMP = 15/2~~

$+5\cos\left(\frac{2\pi}{365}(t-7)\right) + 21.5$ ✓

175

$h(t) = 0.25\sin\left(\frac{2\pi(t-2)}{28.5}\right)$

$\theta = \frac{2\pi}{28.5} \times 2\pi = 28.5$ days ✓

176

P = 0.8 S

AMP = 6 CM MID = 15 CM

t = 0.5 → MID → MIN

MID → MIN a < 0 ✓

$-6\sin\left(\frac{2\pi}{0.8}(t-0.5)\right) + 15$

(0.5, 15) (+0.7, 9)

$\frac{\pi}{2} \times \frac{0.8}{2\pi} = \frac{0.8\pi}{4\pi}$

$\sin\left(\frac{2\pi}{0.8}t\right) = 0.2 = \frac{2}{10}$ ✓

177

P = 0.8

AMP = 6 cm MID = 15 cm

t = 0.2 → MID → MIN

a < 0 MID → MIN

$\sin\left(\frac{2\pi}{0.8}\right) = \frac{\pi}{2} \times \frac{0.8}{2\pi} = \frac{0.8\pi}{4\pi}$

$\sin\left(\frac{2\pi}{0.8}\right) = 0.25$ (9,0) (0.2,1)

$-6\sin\left(\frac{2\pi}{0.8}(t-0.2)\right) + 15$

(0.2, 15) (0.4, 9) ✓

PRECALCULUS

$\sin(x) = \frac{1}{3}$

$\sin^{-1}\left(\frac{1}{3}\right) = 0.34$

$\sin^{-1}(\theta) = 0.34$ RAD

π − 0.34 = 2.8 RAD

$\sin^{-1}(1) = 2.8$ RAD

2.8 + 2πN
0.34 + 2πN

172

sin(x) = 1

$\sin^{-1}(1) = 1,5707963$

$\pi - \sin^{-1}(1) = 1,5707963$

$\sin^{-1}(1) \times \left(\frac{180}{\pi}\right) = 90°$

90° + N.360 ✓

178

$-\frac{\pi}{2}$ to $\frac{5\pi}{2}$

cos(x) = −0.7

$\cos^{-1}(0.7) = 2,3.4619362$

≈ 134.427004°

π − 2,35 = 0,795398

θ = 45,354718°

cos(θ) (θ + 2π)

x = 2.35 + N.2π

x = −2.35 + N.2π

N	2.35 + N.2π	
−1	−3.93	N
0	2.35	Y
1	8.63	N

N − 2.35 + N.2π

0	−2.35	N
1	3.93	Y
2	10.21	N

$-\frac{\pi}{2} = -1,57$ $\frac{5\pi}{2} = 7,853$

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cos(x) = −0.1   (19/07/2016) 179

$\cos^{-1}(x) = 1,47062891 = \alpha$

π − α = 1,67096875 = β

α = 84,2608295°

β = 95,7391705°

~~$\cos(1,47(x+\pi))$~~

~~N = 2 0,1~~

~~N = 3 0,1~~

−2π.N ±

1,67 + N.2π
−1,67 + N.2π

180

$\frac{3\pi}{2}$ to $\frac{9\pi}{2}$

sin(x) = 0.65

~~$\sin^{-1}(0.65) = 0,70758437$~~

~~β = 40,5416019°~~

~~θ.707 + N.2π~~

~~0,65 × $\frac{3\pi}{2}$ = 1,...~~

sin $\frac{3\pi}{2}$ = 4,712388

$\frac{9\pi}{2}$ = 14,1371669

$\sin^{-1}(0,65) = 0,70758...$

β = 40,5416019°

β + Nπ

π − β = 2,4340822

A = 2,4340822

~~sin(β + N·2π)~~

~~sin(A + N·2π)~~

A(x) = A + (N·2π)

B(x) = B + (N.2π)

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sin(x) = 0.25 = x   181

$\sin^{-1}(x) = 0,252680255$

π − 0,25 = 2,8891240

sin(θ) = π − x

sin(x) = 0.55 = β

$\sin^{-1}(\beta) = 0.582364138$

β = 33,3670130°

π − β′ = 2,55922842

~~β + N.2π~~ −β + N.2π

~~α + N.2π~~ α + N.2π ✓

182

cos(x) = 0.2

{90°, 450°} ✓

$\cos^{-1}(x) = 1,3694384 = \alpha$

α′ = 78,460040°

π − α = 1,77215425 = β

β′ = 101,536759°

α + N.2π

β + N.2π

183

sin(x) = −0.7

$\sin^{-1}(0.7) = -0,775397497$

π − θ = 2.36619516

x + N.2π   x + N.360

θ = 44,427004°

α = 135,572996°

184

sin(x) = 0.25 = θ

$\sin^{-1}(\theta) = 0.252680255$

π − θ = 2,88891240

α = 14,4775122 β = 165,522488°

α + N × 360   β + N × 360

α + N × 2π   β + N × 2π

{−270 to 270} 14,48° −194,48°

105,52° ✓

185

cos(x) = 0,35 = α

$\cos^{-1}(\alpha) = 1,21322522$

α = 69,5126849°

π − α = θ

θ = 1,92836743

θ = 110,487315

α + N × 2π   θ + N × 2π

cos(θ) (θ + 2π) ✓

1,21 + N × 2π = 0,35

−1,21 + N × 2π = 0,35

186

sin(x) = −1 = θ

$\sin^{-1}(\theta) = -1,5707963$

~~π + θ = 1,5707963~~

π − θ = 4,71238898

α = −90°   ~~β = 90°~~

α = 270°

188

sin(x) = −0.7

$\sin^{-1}(x) = -0,775397497$

π − θ = 3,91699015

sin(θ + (x × 2π))

α = −44,4270040°

θ = 224,427004°

π + θ = 2,36619516

β = 135,572996°

α + x.2π

β + x.2π ✓

189

cos(x) = −0.35 = θ

~~$\cos^{-1}(\theta) = 1,21322522$~~

π − θ = 1,92836743

{π + 0.4π} = (3,1415, 12566)

$\cos^{-1}(-0,35) = 1,92836743 = \theta$

π − θ = 1,21322522 = β

8,21155274

14,4947310

β = 69,5126849° θ = 110,487315

π + θ = 5,06996008 = α

~~290,487315~~

θ + N.2π   β + N.π

4,35481788

10,6380032

~~7,92836743~~

18

sin(x) = −0.25 = θ

$\sin^{-1}(\theta) = -0,252680255$

π − θ = 3,39427291 = β

π + θ = 2,88891240 = α

θ = −14,4775122°

α = 290,487315°

β = 194,477512°

~~α + N.2π~~   θ + N.2π

β + N.2π ✓

191

sin(x) = 0.65

$\sin^{-1}(0.65) = 0,707584437 = \theta$

π − θ = 2,4340822 = α

θ = 40,5416019°

α = 139,458398°

{$\frac{3\pi}{2}$, $\frac{9\pi}{2}$} = (4,71, 14,14)

θ + 2π.N {13,2737851}

α + 2π.N {8,7171952} ~~11,85...~~

θ + 2π.N {6,9907697}

192

sin(x) = 0.4 = θ

$\theta = \sin^{-1}(0.4) = 0,411516846$

π − θ = 2,73007581 = β