

Formulas and constants:

The speed of light = $3 \cdot 10^8 \text{ m/s}$

Gravitational acceleration at sea level = 9.81 m/s^2

$$\mu = 3.986 \cdot 10^5 \text{ km}^3/\text{s}^2$$

$$F = m \cdot a = \Delta p / \Delta t$$

$$F = GMm/r^2$$

$$F = mv^2/r$$

$$G = 6.67 \cdot 10^{-11} \text{ Nm}^2/\text{kg}^2$$

$$M = 5.98 \cdot 10^{24} \text{ kg}$$

$R_E = 6370 \text{ km}$ mean value, $R_E = 6378 \text{ km}$ at the equator

X in deciBel (dB): $X_{\text{dB}} = 10 \log_{10}(X_{\text{lin}})$

The semi major axis in an ellipsoid = $\frac{1}{2} (R_a + R_p)$

$$e = (R_a - R_p) / (R_a + R_p) = c/a$$

$$\Delta v = I_{\text{sp}} \cdot g_0 \cdot \ln (M_i / M_f)$$

$$v = \sqrt{\mu(2/r - 1/a)}$$

$$F_s = 0.7 + 0.3 e^{-\text{nb. of days}/1000}$$

Boltzmann's constant $k = 1.38 \times 10^{-23} \text{ J/K}$

The sunlight needs about 8 minutes to travel the distance from the Sun to Earth.

$$T^2 = 4\pi^2 a^3 / \mu$$

$$R = 2.44 \cdot \lambda \cdot h / D$$

$$S/N = (EIRP/L_0) \cdot (G_r / N_0 B) \cdot 1/L_a$$

$$G = \eta \times 4\pi A / \lambda^2$$

$$\theta = k\lambda/D, k=70$$

$$L_0 = (4\pi d/\lambda)^2$$

$$E_k = mv^2/2$$