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Continuous Time Signals Formulas

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List of 15 Continuous Time Signals Formulas

Continuous Time Signals

1) Angular Frequency of Signal

$$\text{fx } \omega = 2 \cdot \frac{\pi}{T}$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$\text{ex } 2.001014\text{Hz} = 2 \cdot \frac{\pi}{3.14\text{s}}$$

2) Coupling Co-efficient

$$\text{fx } \gamma = \frac{C_o}{C + C_o}$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

$$\text{ex } 0.299764 = \frac{3.81\text{F}}{8.9\text{F} + 3.81\text{F}}$$

3) Current for Loaded Admittance

$$\text{fx } i_u = i_g \cdot \frac{Y_u}{Y_g + Y_u}$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$\text{ex } 1.486567\text{A} = 4.15\text{A} \cdot \frac{1.2\Omega}{2.15\Omega + 1.2\Omega}$$



4) Damping Co-efficient

$$\text{fx } \zeta = \frac{1}{2 \cdot A_o} \cdot \sqrt{\frac{f_{in}}{f_h}}$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

$$\text{ex } 0.070189\text{Ns/m} = \frac{1}{2 \cdot 21.5} \cdot \sqrt{\frac{50.1\text{Hz}}{5.5\text{Hz}}}$$

5) Damping Co-efficient in State-Space Form

$$\text{fx } \zeta = R_o \cdot \sqrt{\frac{C}{L}}$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)

$$\text{ex } 0.060896\text{Ns/m} = 0.05\Omega \cdot \sqrt{\frac{8.9\text{F}}{6\text{H}}}$$

6) Frequency of Signal

$$\text{fx } f = 2 \cdot \frac{\pi}{\omega}$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

$$\text{ex } 3.141593\text{Hz} = 2 \cdot \frac{\pi}{2\text{Hz}}$$

7) Inverse of System Function

$$\text{fx } H_{inv} = \frac{1}{H_s}$$

[Open Calculator !\[\]\(b64b40baaee5acddc1eab8538ba84754_img.jpg\)](#)

$$\text{ex } 0.416667 = \frac{1}{2.4}$$



8) Natural Frequency 

$$fx \quad f_n = \sqrt{f_{in} \cdot f_h}$$

Open Calculator 


$$ex \quad 16.5997\text{Hz} = \sqrt{50.1\text{Hz} \cdot 5.5\text{Hz}}$$

9) Open Loop Gain of Signal 

$$fx \quad A_o = \frac{1}{2 \cdot \zeta} \cdot \sqrt{\frac{f_{in}}{f_h}}$$

Open Calculator 


$$ex \quad 21.55805 = \frac{1}{2 \cdot 0.07\text{Ns/m}} \cdot \sqrt{\frac{50.1\text{Hz}}{5.5\text{Hz}}}$$

10) Output of Time Invariant Signal 

$$fx \quad y_t = x_t \cdot h_t$$

Open Calculator 

$$ex \quad 14.82 = 2.85 \cdot 5.2$$

11) Periodic Signal of Time Fourier 

$$fx \quad x_p = \sin\left(\frac{2 \cdot \pi}{t}\right)$$

Open Calculator 

$$ex \quad 0.642788 = \sin\left(\frac{2 \cdot \pi}{9}\right)$$



12) Resistance with respect to Damping Coefficient

$$fx \quad R_o = \frac{\zeta}{\left(\frac{C}{L}\right)^{\frac{1}{2}}}$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)](#)

$$ex \quad 0.057475\Omega = \frac{0.07Ns/m}{\left(\frac{8.9F}{6H}\right)^{\frac{1}{2}}}$$

13) Time Period of Signal

$$fx \quad T = 2 \cdot \frac{\pi}{\omega}$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)

$$ex \quad 3.141593s = 2 \cdot \frac{\pi}{2Hz}$$

14) Transfer Function

$$fx \quad H = \frac{S_{out}}{S_{in}}$$

[Open Calculator !\[\]\(bd3b31712ad9bab5a241210fa6925cdd_img.jpg\)](#)

$$ex \quad 0.97619 = \frac{4.1}{4.2}$$

15) Voltage for Loaded Admittance

$$fx \quad V_u = \frac{i_g}{Y_g + Y_u}$$

[Open Calculator !\[\]\(7bc43b319a082987e20f7bf78f4bab80_img.jpg\)](#)

$$ex \quad 1.238806V = \frac{4.15A}{2.15\Omega + 1.2\Omega}$$



Variables Used









- A_o Open Loop Gain
- C Capacitance (Farad)
- C_o Input Capacitance (Farad)
- f Frequency (Hertz)
- f_h High Frequency (Hertz)
- f_{in} Input Frequency (Hertz)
- f_n Natural Frequency (Hertz)
- H Transfer Function
- H_{inv} Inverse System Function
- H_s System Function
- h_t Impulse Response
- i_g Current for Internal Admittance (Ampere)
- i_u Current for Loaded Admittance (Ampere)
- L Inductance (Henry)
- R_o Initial Resistance (Ohm)
- S_{in} Input Signal
- S_{out} Output Signal
- t Time Periodic Signal
- T Time Period (Second)
- V_u Voltage of Loaded Admittance (Volt)
- x_p Periodic Signal



- x_t Time Invariant Input Signal
- Y_g Internal Admittance (*Ohm*)
- y_t Time Invariant Output Signal
- Y_u Loaded Admittance (*Ohm*)
- Υ Coupling Coefficient
- ζ Damping Co-efficient (*Newton Second per Meter*)
- ω Angular Frequency (*Hertz*)



Constants, Functions, Measurements used

- **Constant:** **pi**, 3.14159265358979323846264338327950288
Archimedes' constant
- **Function:** **sin**, $\sin(\text{Angle})$
Trigonometric sine function
- **Function:** **sqrt**, $\sqrt{\text{Number}}$
Square root function
- **Measurement:** **Time** in Second (s)
Time Unit Conversion 
- **Measurement:** **Electric Current** in Ampere (A)
Electric Current Unit Conversion 
- **Measurement:** **Frequency** in Hertz (Hz)
Frequency Unit Conversion 
- **Measurement:** **Capacitance** in Farad (F)
Capacitance Unit Conversion 
- **Measurement:** **Electric Resistance** in Ohm (Ω)
Electric Resistance Unit Conversion 
- **Measurement:** **Inductance** in Henry (H)
Inductance Unit Conversion 
- **Measurement:** **Electric Potential** in Volt (V)
Electric Potential Unit Conversion 
- **Measurement:** **Damping Coefficient** in Newton Second per Meter (Ns/m)
Damping Coefficient Unit Conversion 



Check other formula lists

- [Continuous Time Signals Formulas](#) 
- [Discrete Time Signals Formulas](#) 

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