Important Continuous Time Signals Formulas PDF

Formulas
Examples
with Units

List of 15
Important Continuous Time Signals Formulas

1) Angular Frequency of Signal Formula

Evaluate Formula

Formula

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

Example with Units

$$2.001\,\text{Hz} = 2 \cdot \frac{3.1416}{3.14\,\text{s}}$$

2) Coupling Co-efficient Formula

Evaluate Formula

Formula

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

Example with Units

$$0.2998 = \frac{3.81\,\text{F}}{8.9\,\text{F} + 3.81\,\text{F}}$$

3) Current for Loaded Admittance Formula

Evaluate Formula

Formula

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

Example with Units

$$1.4866\,\text{A} = 4.15\,\text{A} \cdot \frac{1.2\,\Omega}{2.15\,\Omega + 1.2\,\Omega}$$

4) Damping Co-efficient Formula

Evaluate Formula

Formula

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

Example with Units

$$0.0702\,\text{Ns/m} = \frac{1}{2 \cdot 21.5} \cdot \sqrt{\frac{50.1\,\text{Hz}}{5.5\,\text{Hz}}}$$

5) Damping Co-efficient in State-Space Form Formula

Evaluate Formula

Formula

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

Example with Units

$$0.0609\,\text{Ns/m} = 0.05\,\Omega \cdot \sqrt{\frac{8.9\,\text{F}}{6\,\text{H}}}$$

6) Frequency of Signal Formula

Evaluate Formula

Formula

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

Example with Units

$$3.1416\,\text{Hz} = 2 \cdot \frac{3.1416}{2\,\text{Hz}}$$

7) Inverse of System Function Formula

Evaluate Formula

Formula

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

Example

$$0.4167 = \frac{1}{2.4}$$

8) Natural Frequency Formula

Evaluate Formula

Formula

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

Example with Units

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

9) Open Loop Gain of Signal Formula

Evaluate Formula

Formula

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

Example with Units

$$21.5581 = \frac{1}{2 \cdot 0.07\,\text{Ns/m}} \cdot \sqrt{\frac{50.1\,\text{Hz}}{5.5\,\text{Hz}}}$$

10) Output of Time Invariant Signal Formula

Evaluate Formula

Formula

$$y_t = x_t \cdot h_t$$

Example

$$14.82 = 2.85 \cdot 5.2$$

11) Periodic Signal of Time Fourier Formula

Evaluate Formula

Formula

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

Example

$$0.6428 = \sin\left(\frac{2 \cdot 3.1416}{9}\right)$$

12) Resistance with respect to Damping Coefficient Formula

Evaluate Formula

Formula

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

Example with Units

$$0.0575\,\Omega = \frac{0.07\,\text{Ns/m}}{\left(\frac{8.9\,\text{F}}{6\,\text{H}}\right)^{\frac{1}{2}}}$$

13) Time Period of Signal Formula

Evaluate Formula

Formula

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

Example with Units

$$3.1416\,\text{s} = 2 \cdot \frac{3.1416}{2\,\text{Hz}}$$

14) Transfer Function Formula

Evaluate Formula

Formula

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

Example

$$0.9762 = \frac{4.1}{4.2}$$

15) Voltage for Loaded Admittance Formula

Evaluate Formula

Formula

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

Example with Units

$$1.2388\,\text{V} = \frac{4.15\,\text{A}}{2.15\,\Omega + 1.2\,\Omega}$$

Variables used in list of Continuous Time Signals Formulas above

- 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)*
- γ Coupling Coefficient
- ζ Damping Co-efficient *(Newton Second per Meter)*
- ω Angular Frequency *(Hertz)*

Constants, Functions, Measurements used in list of Continuous Time Signals Formulas above

- constant(s): **pi**, 3.14159265358979323846264338327950288 *Archimedes' constant*
- Functions: **sin**, sin(Angle) *Sine is a trigonometric function that describes the ratio of the length of the opposite side of a right triangle to the length of the hypotenuse.*
- Functions: **sqrt**, sqrt(Number) *A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.*
- 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*

Download other Important Signal and Systems PDFs

- Important Continuous Time Signals Formulas
- Important Discrete Time Signals Formulas

Try our Unique Visual Calculators

- Reverse percentage
- HCF calculator
- Simple fraction

Please SHARE this PDF with someone who needs it!

This PDF can be downloaded in these languages

English Spanish French German Russian Italian Portuguese Polish Dutch

7/9/2024 | 5:28:53 AM UTC