



Wavelength Formulas

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Examples!

Conversions!

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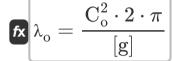




List of 14 Wavelength Formulas

Wavelength **3**

1) Deepwater Wavelength given Celerity of Deepwater Wave



Open Calculator 🗗

ex
$$12.97431 \text{m} = \frac{(4.5 \text{m/s})^2 \cdot 2 \cdot \pi}{[\text{g}]}$$

2) Deepwater Wavelength given Deepwater Celerity

$$\lambda_{
m o} = rac{\lambda \cdot C_{
m o}}{C}$$

Open Calculator 🚰

ex
$$12.99857$$
m = $\frac{10.11$ m $\cdot 4.5$ m/s 3.5 m/s

3) Deepwater Wavelength given Units of Feet

fx
$$\left[\lambda_{\mathrm{ft}} = 5.12 \cdot \mathrm{T}^2
ight]$$

Open Calculator 🗗



4) Deepwater Wavelength given Wave Celerity

fx $\lambda_{o} = C_{o} \cdot T$

Open Calculator

 $\boxed{\textbf{ex}} \ 13.5 \text{m} = 4.5 \text{m/s} \cdot 3 \text{s}$

5) Deepwater Wavelength when SI systems Units of meters is Considered

fx $\lambda_{
m o} = 1.56 \cdot T^2$

Open Calculator 2

6) Eckert's Equation for Wavelength

 $\lambda = \lambda_{
m o} \cdot \sqrt{ anhigg(rac{2 \cdot \pi \cdot {
m d}}{\lambda_{
m o}}igg)}$

Open Calculator

 $extbf{ex} 10.35637 ext{m} = 13 ext{m} \cdot \sqrt{ anhigg(rac{2 \cdot \pi \cdot 1.55 ext{m}}{13 ext{m}}igg)}$

7) Long Wave Simplification for Wavelength

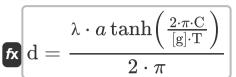


ex $11.69627 \text{m} = 3 \text{s} \cdot \sqrt{[\text{g}] \cdot 1.55 \text{m}}$





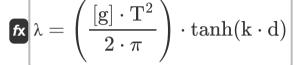
8) Water Depth given Wave Celerity and Wavelength



Open Calculator

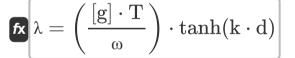
$$extbf{ex} \left[1.556351 ext{m} = rac{10.11 ext{m} \cdot a anh\left(rac{2 \cdot \pi \cdot 3.5 ext{m/s}}{ ext{[g]} \cdot 3 ext{s}}
ight)}{2 \cdot \pi}
ight]$$

9) Wavelength as Function of Depth and Wave Period C



Open Calculator 2

10) Wavelength as Function of Water Depth and Wave Period C



Open Calculator



11) Wavelength given Deepwater Celerity and Deepwater Wavelength



Open Calculator 🚰

 $\begin{array}{|c|c|} \hline \textbf{ex} & 10.11111m = \frac{13m \cdot 3.5m/s}{4.5m/s} \\ \hline \end{array}$

12) Wavelength given Deepwater Wavelength

fx $\lambda = \lambda_{\rm o} \cdot \tanh(\mathbf{k} \cdot \mathbf{d})$

Open Calculator

 $\texttt{ex} \ 13 \texttt{m} = 13 \texttt{m} \cdot \tanh(5 \cdot 1.55 \texttt{m})$

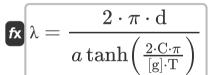
13) Wavelength given Wave Celerity

fx $\lambda = C \cdot T$

Open Calculator

 $ext{ex} 10.5 ext{m} = 3.5 ext{m/s} \cdot 3 ext{s}$

14) Wavelength given Wave Celerity and Wave Speed 🗗



Open Calculator

 $oxed{ex} 10.06874 \mathrm{m} = rac{2 \cdot \pi \cdot 1.55 \mathrm{m}}{a anh \left(rac{2 \cdot 3.5 \mathrm{m/s} \cdot \pi}{[\mathrm{g}] \cdot 3 \mathrm{s}}
ight)}$



Variables Used

- C Wave Celerity (Meter per Second)
- Co Deepwater Wave Celerity (Meter per Second)
- **d** Water Depth (Meter)
- k Wave Number
- T Wave Period (Second)
- **λ** Wavelength (Meter)
- λ_{ft} DeepWater Wavelength in Feet (Foot)
- λ₀ DeepWater Wavelength (Meter)
- **ω** Wave Angular Frequency (Radian per Second)





Constants, Functions, Measurements used

- Constant: pi, 3.14159265358979323846264338327950288
 Archimedes' constant
- Constant: [g], 9.80665

 Gravitational acceleration on Earth
- Function: atanh, atanh(Number)

 The inverse hyperbolic tangent function returns the value whose hyperbolic tangent is a number.
- Function: 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.
- Function: tanh, tanh(Number)

 The hyperbolic tangent function (tanh) is a function that is defined as the ratio of the hyperbolic sine function (sinh) to the hyperbolic cosine function (cosh).
- Measurement: Length in Meter (m), Foot (ft)
 Length Unit Conversion
- Measurement: Time in Second (s)
 Time Unit Conversion
- Measurement: Speed in Meter per Second (m/s)
 Speed Unit Conversion
- Measurement: Angular Frequency in Radian per Second (rad/s)
 Angular Frequency Unit Conversion





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