

Important Overtaking Sight Distance Formulas PDF



Formulas Examples with Units

List of 13 Important Overtaking Sight Distance Formulas

1) Acceleration given Actual Overtaking Time and Overtaking Space Formula

Formula

$$a_{\text{overtaking}} = \frac{4 \cdot s}{T^2}$$

Example with Units

$$2.8005 \text{ m/s}^2 = \frac{4 \cdot 27 \text{ m}}{6.21 \text{ s}^2}$$

Evaluate Formula 

2) Actual Overtaking Distance Formula

Formula

$$d_2 = 2 \cdot s + V_{\text{speed}} \cdot \sqrt{\frac{4 \cdot s}{a_{\text{overtaking}}}}$$

Example with Units

$$79.8168 \text{ m} = 2 \cdot 27 \text{ m} + 6.88 \text{ m/s} \cdot \sqrt{\frac{4 \cdot 27 \text{ m}}{7.67 \text{ m/s}^2}}$$

Evaluate Formula 

3) Actual Overtaking Time given Distance Traveled by On-Coming Vehicle Formula

Formula

$$T = \frac{d_3}{V_{\text{speed}}}$$

Example with Units

$$2.3256 \text{ s} = \frac{16 \text{ m}}{6.88 \text{ m/s}}$$

Evaluate Formula 

4) Actual Overtaking Time given Overtaking Space and Acceleration Formula

Formula

$$T = \sqrt{\frac{4 \cdot s}{a_{\text{overtaking}}}}$$

Example with Units

$$3.7524 \text{ s} = \sqrt{\frac{4 \cdot 27 \text{ m}}{7.67 \text{ m/s}^2}}$$

Evaluate Formula 

5) Distance Traveled by On-Coming Vehicle Formula

Formula

$$d_3 = V_{\text{speed}} \cdot T$$

Example with Units

$$42.7248 \text{ m} = 6.88 \text{ m/s} \cdot 6.21 \text{ s}$$

Evaluate Formula 

6) Distance Traveled by Overtaking Vehicle Formula

Formula

$$d_1 = V_{\text{speed}} \cdot t_{\text{reaction}}$$

Example with Units

$$68.8 \text{ m} = 6.88 \text{ m/s} \cdot 10 \text{ s}$$

Evaluate Formula 



7) Overtaking Sight Distance given Distance Traveled Formula

Formula

$$OSD = d_1 + d_2 + d_3$$

Example with Units

$$62\text{ m} = 25\text{ m} + 21\text{ m} + 16\text{ m}$$

Evaluate Formula 

8) Overtaking Space Formula

Formula

$$s = 0.7 \cdot V_{\text{speed}} + 6$$

Example with Units

$$10.816\text{ m} = 0.7 \cdot 6.88\text{ m/s} + 6$$

Evaluate Formula 

9) Overtaking Space given Actual Overtaking Time and Acceleration Formula

Formula

$$s = \frac{T^2 \cdot a_{\text{overtaking}}}{4}$$

Example with Units

$$73.9467\text{ m} = \frac{6.21\text{ s}^2 \cdot 7.67\text{ m/s}^2}{4}$$

Evaluate Formula 

10) Reaction Time Given Overtaking Distance and Vehicle Speed Formula

Formula

$$t_{\text{reaction}} = \frac{d_1}{V_{\text{speed}}}$$

Example with Units

$$3.6337\text{ s} = \frac{25\text{ m}}{6.88\text{ m/s}}$$

Evaluate Formula 

11) Vehicle Speed given Distance Traveled by On-Coming Vehicle Formula

Formula

$$V_{\text{speed}} = \frac{d_3}{T}$$

Example with Units

$$2.5765\text{ m/s} = \frac{16\text{ m}}{6.21\text{ s}}$$

Evaluate Formula 

12) Vehicle Speed Given Overtaking Distance and Reaction Time Formula

Formula

$$V_{\text{speed}} = \frac{d_1}{t_{\text{reaction}}}$$

Example with Units

$$2.5\text{ m/s} = \frac{25\text{ m}}{10\text{ s}}$$

Evaluate Formula 

13) Vehicle Speed given Overtaking Space Formula

Formula

$$V_{\text{speed}} = \frac{s - 6}{0.7}$$

Example with Units

$$30\text{ m/s} = \frac{27\text{ m} - 6}{0.7}$$

Evaluate Formula 



Variables used in list of Overtaking Sight Distance Formulas above

- **a_{overtaking}** Overtaking Acceleration (Meter per Square Second)
- **d₁** Distance Traveled by Overtaking Vehicle (Meter)
- **d₂** Distance of Actual Overtaking (Meter)
- **d₃** Distance Traveled by On-Coming Vehicle (Meter)
- **OSD** Overtaking Sight Distance (Meter)
- **s** Overtaking Space (Meter)
- **T** Actual Overtaking Time (Second)
- **t_{reaction}** Reaction Time (Second)
- **V_{speed}** Vehicle Speed (Meter per Second)

Constants, Functions, Measurements used in list of Overtaking Sight Distance Formulas above

- **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:** **Length** in Meter (m)
Length Unit Conversion 
- **Measurement:** **Time** in Second (s)
Time Unit Conversion 
- **Measurement:** **Speed** in Meter per Second (m/s)
Speed Unit Conversion 
- **Measurement:** **Acceleration** in Meter per Square Second (m/s²)
Acceleration Unit Conversion 



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