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Stopping Sight Distance Formulas

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List of 12 Stopping Sight Distance Formulas

Stopping Sight Distance

1) Braking Distance given Lag Distance and Stopping Sight Distance

Open Calculator

fx $$l = SSD - LD$$

ex $$26.7\text{m} = 61.4\text{m} - 34.7\text{m}$$

2) Braking Distance of Vehicle during Braking Operation

Open Calculator

fx $$l = \frac{v_{vehicle}^2}{2 \cdot [g] \cdot f}$$

ex $$203.1613\text{m} = \frac{(28.23\text{m/s})^2}{2 \cdot [g] \cdot 0.2}$$

3) Kinetic Energy of Vehicle at Design Speed

Open Calculator

fx $$K.E = \frac{W \cdot v_{vehicle}^2}{2 \cdot [g]}$$

ex $$9345.422\text{J} = \frac{230\text{kg} \cdot (28.23\text{m/s})^2}{2 \cdot [g]}$$

4) Lag Distance given Stopping Sight Distance and Braking Distance

Open Calculator

fx $$\mathrm{LD} = \mathrm{SSD} - \mathrm{l}$$

ex $$13.4\mathrm{m} = 61.4\mathrm{m} - 48\mathrm{m}$$

5) Maximum Frictional Force Developed during Braking Operation of Vehicle

Open Calculator

fx $$\mathrm{F} = \frac{\mathrm{W} \cdot \mathrm{v}_{\mathrm{vehicle}}^2}{2 \cdot [\mathrm{g}] \cdot \mathrm{l}}$$

ex $$194.6963\mathrm{N} = \frac{230\mathrm{kg} \cdot (28.23\mathrm{m/s})^2}{2 \cdot [\mathrm{g}] \cdot 48\mathrm{m}}$$

6) Maximum Frictional Force given Kinetic Energy of Vehicle at Design Speed

Open Calculator

fx $$\mathrm{F} = \frac{\mathrm{K.E}}{\mathrm{l}}$$

ex $$25\mathrm{N} = \frac{1200\mathrm{J}}{48\mathrm{m}}$$

7) Reaction Time given Stopping Sight Distance and Vehicle Velocity

Open Calculator

fx $$t_{reaction} = \frac{SSD - \frac{V_{speed}^2}{2 \cdot [g] \cdot f}}{V_{speed}}$$

ex $$7.170507s = \frac{61.4m - \frac{(6.88m/s)^2}{2 \cdot [g] \cdot 0.2}}{6.88m/s}$$

8) Stopping Sight Distance given Lag Distance and Braking Distance

Open Calculator

fx $$SSD = LD + l$$

ex $$82.7m = 34.7m + 48m$$

9) Stopping Sight Distance given Vehicle Velocity and Reaction Time of Vehicle

Open Calculator

fx $$SSD = V_{speed} \cdot t_{reaction} + \frac{V_{speed}^2}{2 \cdot [g] \cdot f}$$

ex $$80.86691m = 6.88m/s \cdot 10s + \frac{(6.88m/s)^2}{2 \cdot [g] \cdot 0.2}$$

10) Velocity of Vehicle given Braking Distance after Braking Operation

Open Calculator

fx $$v_{vehicle} = \sqrt{2 \cdot [g] \cdot f \cdot l}$$

ex $$13.7218m/s = \sqrt{2 \cdot [g] \cdot 0.2 \cdot 48m}$$

11) Weight of Vehicle given Kinetic Energy of Vehicle at Design Speed

Open Calculator

fx $$W = \frac{2 \cdot [g] \cdot F \cdot l}{v_{vehicle}^2}$$

ex $$275.2492\text{kg} = \frac{2 \cdot [g] \cdot 233\text{N} \cdot 48\text{m}}{(28.23\text{m/s})^2}$$

12) Work Done against Friction in Stopping Vehicle

Open Calculator

fx $$W_{vehicle} = f \cdot W \cdot l$$

ex $$2208\text{J} = 0.2 \cdot 230\text{kg} \cdot 48\text{m}$$

Variables Used

- **f** Coefficient of Friction
- **F** Maximum Frictional Force *(Newton)*
- **K.E** Kinetic Energy of Vehicle at Design Speed *(Joule)*
- **l** Braking Distance *(Meter)*
- **LD** Lag Distance *(Meter)*
- **SSD** Sight Stopping Distance *(Meter)*
- $t_{reaction}$ Reaction Time *(Second)*
- V_{speed} Vehicle Speed *(Meter per Second)*
- $v_{vehicle}$ Velocity *(Meter per Second)*
- **W** Total Weight of Vehicle *(Kilogram)*
- $W_{vehicle}$ Work done against Friction *(Joule)*

Constants, Functions, Measurements used

- Constant: **[g]**, 9.80665 Meter/Second²
  Gravitational acceleration on Earth
- Function: **sqrt**, sqrt(Number)
  Square root function
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Weight** in Kilogram (kg)
  Weight Unit Conversion
- Measurement: **Time** in Second (s)
  Time Unit Conversion
- Measurement: **Speed** in Meter per Second (m/s)
  Speed Unit Conversion
- Measurement: **Energy** in Joule (J)
  Energy Unit Conversion
- Measurement: **Force** in Newton (N)
  Force Unit Conversion

Check other formula lists

- **Overtaking Sight Distance Formulas**
- **Stopping Sight Distance Formulas**

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