



# **Turning Radius Formulas**

Calculators!

Examples!

**Conversions!** 

Bookmark calculatoratoz.com, unitsconverters.com

Widest Coverage of Calculators and Growing - 30,000+ Calculators! Calculate With a Different Unit for Each Variable - In built Unit Conversion! Widest Collection of Measurements and Units - 250+ Measurements!

Feel free to SHARE this document with your friends!

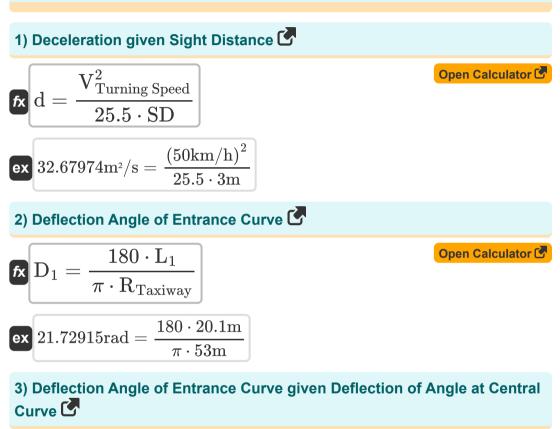
Please leave your feedback here ...





## List of 19 Turning Radius Formulas

## Turning Radius 🕑



fx 
$${
m D}_1=35-{
m D}_2$$
 Open Calculator  $ar{ar{C}}$ 



fx 
$$\mathrm{D}_2 = 35 - \mathrm{D}_1$$

ex 14rad = 35 - 21rad

# 5) Deflection of Angle at Central Curve when Length of Central Curve is considered

fx 
$$D_2 = rac{180 \cdot L2}{\pi \cdot R2}$$

$$14.09926 \text{rad} = \frac{180 \cdot 25.1 \text{m}}{\pi \cdot 102 \text{m}}$$

6) Distance between Midway Points of Main Gears and Edge of Taxiway Pavements

$$fx \qquad \qquad \textbf{Open Calculator Constraints} \\ D_{Midway} = (0.5 \cdot T_{Width}) - \left(0.388 \cdot \frac{W^2}{R_{Taxiway}}\right) \\ \textbf{ex} \qquad \qquad 17.78968m = (0.5 \cdot 45.1m) - \left(0.388 \cdot \frac{(25.5m)^2}{53m}\right) \\ \end{cases}$$



Open Calculator

7) Horonjeff Equation for Turning Radius of Taxiway 🕑

$$\label{eq:RTaxiway} \begin{split} & \mathbf{K} \mathbf{R}_{\rm Taxiway} = \frac{0.388 \cdot W^2}{(0.5 \cdot {\rm T}_{\rm Width}) - {\rm D}_{\rm Midway}} \\ \\ & \mathbf{K} \\ \\ & \mathbf{S} \\ \\ \\ & \mathbf{S} \\ \\ \\ & \mathbf{S} \\ \\ \\ &$$

#### 8) Length of Central Curve

fx 
$$\mathrm{L2} = rac{\pi \cdot \mathrm{R2} \cdot \mathrm{D}_2}{180}$$

ex 
$$24.9233m = \frac{\pi \cdot 102m \cdot 14rad}{180}$$

# 9) Length of Entrance Curve when Deflection Angle of Entrance Curve is considered

fx 
$$L_1 = \frac{\pi \cdot D_1 \cdot R_{\text{Taxiway}}}{180}$$

$$ex 19.42551m = \frac{\pi \cdot 21 rad \cdot 53m}{180}$$

### 10) Radius of Central Curve given Length of Central Curve

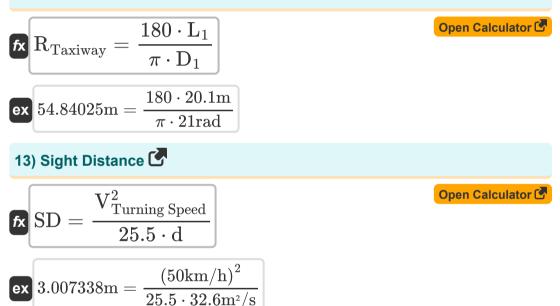
fx 
$$R2 = \frac{180 \cdot L2}{\pi \cdot D_2}$$
 Open Calculator C  
ex  $102.7231m = \frac{180 \cdot 25.1m}{\pi \cdot 14rad}$ 

Open Calculator

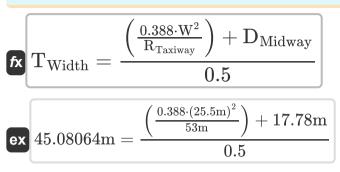
#### 11) Radius of Curve when Velocity in Turn 🕑

fx  $R_{\text{Taxiway}} = \left(\frac{V_{\text{Turning Speed}}}{4.1120}\right)^2$ ex  $147.8542 \text{m} = \left(\frac{50 \text{km/h}}{4.1120}\right)^2$ 

12) Radius of Entrance Curve when Deflection Angle of Entrance Curve is considered



14) Taxiway Width given Turning Radius 🕑



#### 15) Turning Radius 🕑

$$f_{X} R_{Taxiway} = \frac{V_{Turning Speed}^{2}}{125 \cdot \mu_{Friction}}$$

$$e_{X} 7.716049m = \frac{(50 \text{km/h})^{2}}{125 \cdot 0.2}$$

$$f_{X} V_{Turning Speed} = \sqrt{R_{Taxiway} \cdot \mu_{Friction} \cdot 125}$$

$$Open Calculator \textcircled{P}$$

ex  $36.40055 {
m km/h} = \sqrt{53 {
m m} \cdot 0.2 \cdot 125}$ 

### 17) Turning Speed of Aircraft given Sight Distance 🕑

fx 
$$V_{
m Turning\,Speed} = \sqrt{25.5 \cdot {
m d} \cdot {
m SD}}$$

$$m 49.93896 km/h = \sqrt{25.5 \cdot 32.6 m^2/s \cdot 3m}$$



ex

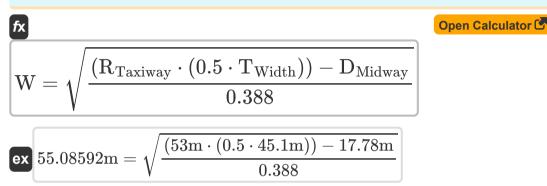
Open Calculator

#### 18) Velocity in Turn 🕑

fx 
$$V_{Turning Speed} = 4.1120 \cdot R_{Taxiway}^{0.5}$$

 $\begin{array}{|c|c|c|c|c|c|c|} \hline \text{ex} & 107.7689 \text{km/h} = 4.1120 \cdot {(53\text{m})}^{0.5} \end{array}$ 

#### 19) Wheelbase given Turning Radius 🕑



## Variables Used

- **d** Deceleration (Square Meter per Second)
- **D<sub>1</sub>** Deflection Angle of Entrance Curve (*Radian*)
- **D**<sub>2</sub> Deflection Angle of Central Curve (*Radian*)
- D<sub>Midway</sub> Distance between Midway Points (Meter)
- L<sub>1</sub> Length of Entrance Curve (*Meter*)
- L2 Length of Central Curve (Meter)
- RTaxiway Radius of Curve for Taxiway (Meter)
- R2 Radius of Central Curve (Meter)
- SD Sight Distance (Meter)
- Twidth Taxiway Width (Meter)
- VTurning Speed Turning Speed of Aircraft (Kilometer per Hour)
- W Wheelbase (Meter)
- **µ**Friction Coefficient of Friction



## **Constants, Functions, Measurements used**

- Constant: pi, 3.14159265358979323846264338327950288 Archimedes' constant
- Function: **sqrt**, sqrt(Number) Square root function
- Measurement: Length in Meter (m) Length Unit Conversion
- Measurement: Speed in Kilometer per Hour (km/h) Speed Unit Conversion
- Measurement: Angle in Radian (rad) Angle Unit Conversion
- Measurement: Kinematic Viscosity in Square Meter per Second (m<sup>2</sup>/s) Kinematic Viscosity Unit Conversion





## Check other formula lists

Taxiway Design Formulas 
 Turning Radius Formulas 

Feel free to SHARE this document with your friends!

### **PDF** Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

1/19/2024 | 4:37:42 PM UTC

Please leave your feedback here...