Important Formulas of Rectangle PDF

Formulas
Examples
with Units

List of 32
Important Formulas of Rectangle

1) Angles of Rectangle Formulas

1.1) Acute Angle between Diagonals of Rectangle Formula

Evaluate Formula

Formula

$$\angle_{d(Acute)} = 2 \cdot atan\left(\frac{b}{l}\right)$$

Example with Units

$$73.7398° = 2 \cdot atan\left(\frac{6\,m}{8\,m}\right)$$

1.2) Angle between Diagonal and Breadth of Rectangle Formula

Evaluate Formula

Formula

$$\angle_{db} = atan\left(\frac{l}{b}\right)$$

Example with Units

$$53.1301° = atan\left(\frac{8\,m}{6\,m}\right)$$

1.3) Angle between Diagonal and Length of Rectangle Formula

Evaluate Formula

Formula

$$\angle_{dl} = atan\left(\frac{b}{l}\right)$$

Example with Units

$$36.8699° = atan\left(\frac{6\,m}{8\,m}\right)$$

1.4) Obtuse Angle between Diagonals of Rectangle Formula

Evaluate Formula

Formula

$$\angle_{d(Obtuse)} = 2 \cdot atan\left(\frac{l}{b}\right)$$

Example with Units

$$106.2602° = 2 \cdot atan\left(\frac{8\,m}{6\,m}\right)$$

2) Area of Rectangle Formulas

2.1) Area of Rectangle Formula

Evaluate Formula

Formula

$$A = l \cdot b$$

Example with Units

$$48\,m² = 8\,m \cdot 6\,m$$

2.2) Area of Rectangle given Breadth and Diagonal Formula

Evaluate Formula

Formula

$$A = b \cdot \sqrt{d^2 - b^2}$$

Example with Units

$$48\,m² = 6\,m \cdot \sqrt{10\,m^2 - 6\,m^2}$$

2.3) Area of Rectangle given Length and Diagonal Formula

Formula

$$A = l \cdot \sqrt{d^2 - l^2}$$

Example with Units

$$48\,m^2 = 8\,m \cdot \sqrt{10\,m^2 - 8\,m^2}$$

2.4) Area of Rectangle given Perimeter and Breadth Formula

Formula

$$A = \frac{(P \cdot b) - (2 \cdot b^2)}{2}$$

Example with Units

$$48\,m^2 = \frac{(28\,m \cdot 6\,m) - (2 \cdot 6\,m^2)}{2}$$

2.5) Area of Rectangle given Perimeter and Diagonal Formula

Formula

$$A = \frac{\left(\frac{P}{2}\right)^2 - d^2}{2}$$

Example with Units

$$48\,m^2 = \frac{\left(\frac{28\,m}{2}\right)^2 - 10\,m^2}{2}$$

2.6) Area of Rectangle given Perimeter and Length Formula

Formula

$$A = \frac{(P \cdot l) - (2 \cdot l^2)}{2}$$

Example with Units

$$48\,m^2 = \frac{(28\,m \cdot 8\,m) - (2 \cdot 8\,m^2)}{2}$$

3) Circumcircle of Rectangle Formulas

3.1) Circumradius of Rectangle Formula

Formula

$$r_c = \frac{\sqrt{l^2 + b^2}}{2}$$

Example with Units

$$5\,m = \frac{\sqrt{8\,m^2 + 6\,m^2}}{2}$$

3.2) Circumradius of Rectangle given Diagonal Formula

Formula

$$r_c = \frac{d}{2}$$

Example with Units

$$5\,m = \frac{10\,m}{2}$$

3.3) Circumradius of Rectangle given Diameter of Circumcircle Formula

Formula

$$r_c = \frac{D_c}{2}$$

Example with Units

$$5\,m = \frac{10\,m}{2}$$

3.4) Circumradius of Rectangle given Perimeter and Breadth Formula 📲

Formula

$$r_c = \frac{\sqrt{P^2 - (4 \cdot P \cdot b) + (8 \cdot b^2)}}{4}$$

Example with Units

$$5\,m = \frac{\sqrt{28\,m^2 - (4 \cdot 28\,m \cdot 6\,m) + (8 \cdot 6\,m^2)}}{4}$$

3.5) Circumradius of Rectangle given Perimeter and Length Formula 📲

Formula

$$r_c = \frac{\sqrt{P^2 - (4 \cdot P \cdot l) + (8 \cdot l^2)}}{4}$$

Example with Units

$$5\,m = \frac{\sqrt{28\,m^2 - (4 \cdot 28\,m \cdot 8\,m) + (8 \cdot 8\,m^2)}}{4}$$

3.6) Diameter of Circumcircle of Rectangle Formula 📲

Formula

$$D_c = \sqrt{l^2 + b^2}$$

Example with Units

$$10\,m = \sqrt{8\,m^2 + 6\,m^2}$$

3.7) Diameter of Circumcircle of Rectangle given Circumradius Formula 📲

Formula

$$D_c = 2 \cdot r_c$$

Example with Units

$$10\,m = 2 \cdot 5\,m$$

4) Diagonal of Rectangle Formulas 📲

4.1) Diagonal of Rectangle Formula 📲

Formula

$$d = \sqrt{l^2 + b^2}$$

Example with Units

$$10\,m = \sqrt{8\,m^2 + 6\,m^2}$$

4.2) Diagonal of Rectangle given Area and Breadth Formula 📲

Formula

$$d = \sqrt{\left(\frac{A}{b}\right)^2 + b^2}$$

Example with Units

$$10\,m = \sqrt{\left(\frac{48\,m^2}{6\,m}\right)^2 + 6\,m^2}$$

4.3) Diagonal of Rectangle given Area and Length Formula 📲

Formula

$$d = \sqrt{\left(\frac{A}{l}\right)^2 + l^2}$$

Example with Units

$$10\,m = \sqrt{\left(\frac{48\,m^2}{8\,m}\right)^2 + 8\,m^2}$$

5) Perimeter of Rectangle Formulas ⤤

5.1) Perimeter of Rectangle Formula ⤤

Formula

$$P = 2 \cdot (l + b)$$

Example with Units

$$28_m = 2 \cdot (8_m + 6_m)$$

Evaluate Formula ⤤

5.2) Perimeter of Rectangle given Area and Breadth Formula ⤤

Formula

$$P = 2 \cdot \left(\left(\frac{A}{b} \right) + b \right)$$

Example with Units

$$28_m = 2 \cdot \left(\left(\frac{48_{m^2}}{6_m} \right) + 6_m \right)$$

Evaluate Formula ⤤

5.3) Perimeter of Rectangle given Area and Diagonal Formula ⤤

Formula

$$P = 2 \cdot \sqrt{d^2 + (2 \cdot A)}$$

Example with Units

$$28_m = 2 \cdot \sqrt{10_m{}^2 + (2 \cdot 48_{m^2})}$$

Evaluate Formula ⤤

5.4) Perimeter of Rectangle given Area and Length Formula ⤤

Formula

$$P = \frac{2 \cdot (A + l^2)}{l}$$

Example with Units

$$28_m = \frac{2 \cdot (48_{m^2} + 8_m{}^2)}{8_m}$$

Evaluate Formula ⤤

5.5) Perimeter of Rectangle given Diagonal and Breadth Formula ⤤

Formula

$$P = 2 \cdot \left(\sqrt{d^2 - b^2} + b \right)$$

Example with Units

$$28_m = 2 \cdot \left(\sqrt{10_m{}^2 - 6_m{}^2} + 6_m \right)$$

Evaluate Formula ⤤

5.6) Perimeter of Rectangle given Diagonal and Length Formula ⤤

Formula

$$P = 2 \cdot \left(l + \sqrt{d^2 - l^2} \right)$$

Example with Units

$$28_m = 2 \cdot \left(8_m + \sqrt{10_m{}^2 - 8_m{}^2} \right)$$

Evaluate Formula ⤤

6) Sides of Rectangle Formulas ⤤

6.1) Breadth of Rectangle given Area Formula ⤤

Formula

$$b = \frac{A}{l}$$

Example with Units

$$6_m = \frac{48_{m^2}}{8_m}$$

Evaluate Formula ⤤

6.2) Breadth of Rectangle given Diagonal Formula 📲

Formula

$$b = \sqrt{d^2 - l^2}$$

Example with Units

$$6\,\text{m} = \sqrt{10\,\text{m}^2 - 8\,\text{m}^2}$$

6.3) Breadth of Rectangle given Perimeter Formula 📲

Formula

$$b = \frac{P - (2 \cdot l)}{2}$$

Example with Units

$$6\,\text{m} = \frac{28\,\text{m} - (2 \cdot 8\,\text{m})}{2}$$

6.4) Length of Rectangle given Area and Breadth Formula 📲

Formula

$$l = \frac{A}{b}$$

Example with Units

$$8\,\text{m} = \frac{48\,\text{m}^2}{6\,\text{m}}$$

6.5) Length of Rectangle given Area and Diagonal Formula 📲

Formula

$$l = \sqrt{\frac{d^2 + \sqrt{d^4 - (4 \cdot A^2)}}{2}}$$

Example with Units

$$8\,\text{m} = \sqrt{\frac{10\,\text{m}^2 + \sqrt{10\,\text{m}^4 - (4 \cdot 48\,\text{m}^2\,^2)}}{2}}$$

6.6) Length of Rectangle given Area and Perimeter Formula 📲

Formula

$$l = \frac{\frac{P}{2} + \sqrt{\left(\frac{P^2}{4}\right) - (4 \cdot A)}}{2}$$

Example with Units

$$8\,\text{m} = \frac{\frac{28\,\text{m}}{2} + \sqrt{\left(\frac{28\,\text{m}^2}{4}\right) - (4 \cdot 48\,\text{m}^2)}}{2}$$

Variables used in list of Important Formulas of Rectangle above

- $\angle_{d(Acute)}$ Acute Angle between Diagonals of Rectangle *(Degree)*
- $\angle_{d(Obtuse)}$ Obtuse Angle between Diagonals of Rectangle *(Degree)*
- $\angle_{db}$ Angle between Diagonal and Breadth of Rectangle *(Degree)*
- $\angle_{dl}$ Angle between Diagonal and Length of Rectangle *(Degree)*
- **A** Area of Rectangle *(Square Meter)*
- **b** Breadth of Rectangle *(Meter)*
- **d** Diagonal of Rectangle *(Meter)*
- D_c Diameter of Circumcircle of Rectangle *(Meter)*
- **l** Length of Rectangle *(Meter)*
- **P** Perimeter of Rectangle *(Meter)*
- r_c Circumradius of Rectangle *(Meter)*

Constants, Functions, Measurements used in list of Important Formulas of Rectangle above

- Functions: **atan**, atan(Number)
  Inverse tan is used to calculate the angle by applying the tangent ratio of the angle, which is the opposite side divided by the adjacent side of the right triangle.
- 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.
- Functions: **tan**, tan(Angle)
  The tangent of an angle is a trigonometric ratio of the length of the side opposite an angle to the length of the side adjacent to an angle in a right triangle.
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Area** in Square Meter (m²)
  Area Unit Conversion
- Measurement: **Angle** in Degree (°)
  Angle Unit Conversion

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