Important Parallelogram Formulas PDF

Formulas
Examples
with Units

List of 31
Important Parallelogram Formulas

1) Angles of Parallelogram Formulas

1.1) Acute Angle of Parallelogram Formula

Evaluate Formula

Formula

$$\angle_{Acute} = \pi - \angle_{Obtuse}$$

Example with Units

$$45° = 3.1416 - 135°$$

1.2) Obtuse Angle of Parallelogram Formula

Evaluate Formula

Formula

$$\angle_{Obtuse} = \pi - \angle_{Acute}$$

Example with Units

$$135° = 3.1416 - 45°$$

2) Area of Parallelogram Formulas

2.1) Area of Parallelogram Formula

Evaluate Formula

Formula

$$A = e_{Long} \cdot e_{Short} \cdot \sin\left(\angle_{Acute}\right)$$

Example with Units

$$59.397\,\text{m}^2 = 12\,\text{m} \cdot 7\,\text{m} \cdot \sin\left(45°\right)$$

2.2) Area of Parallelogram given Area of Long Diagonal Triangle Formula

Evaluate Formula

Formula

$$A = 2 \cdot A_{l(Triangle)}$$

Example with Units

$$60\,\text{m}^2 = 2 \cdot 30\,\text{m}^2$$

2.3) Area of Parallelogram given Diagonals and Acute Angle between Diagonals Formula

Evaluate Formula

Formula

$$A = \frac{1}{2} \cdot d_{Long} \cdot d_{Short} \cdot \sin\left(\angle_{d(Acute)}\right)$$

Example with Units

$$62.0496\,\text{m}^2 = \frac{1}{2} \cdot 18\,\text{m} \cdot 9\,\text{m} \cdot \sin\left(50°\right)$$

2.4) Area of Parallelogram given Diagonals and Obtuse Angle between Diagonals Formula

Evaluate Formula

Formula

$$A = \frac{1}{2} \cdot d_{Long} \cdot d_{Short} \cdot \sin\left(\angle_{d(Obtuse)}\right)$$

Example with Units

$$62.0496\,\text{m}^2 = \frac{1}{2} \cdot 18\,\text{m} \cdot 9\,\text{m} \cdot \sin\left(130°\right)$$

2.5) Area of Parallelogram given Heights and Acute Angle Formula

Evaluate Formula

Formula

$$A = \frac{h_{Long} \cdot h_{Short}}{\sin\left(\angle_{Acute}\right)}$$

Example with Units

$$56.5685\,\text{m}^2 = \frac{5\,\text{m} \cdot 8\,\text{m}}{\sin\left(45°\right)}$$

2.6) Area of Parallelogram given Heights and Obtuse Angle Formula

Evaluate Formula

Formula

$$A = \frac{h_{Long} \cdot h_{Short}}{\sin\left(\angle_{Obtuse}\right)}$$

Example with Units

$$56.5685\,\text{m}^2 = \frac{5\,\text{m} \cdot 8\,\text{m}}{\sin\left(135°\right)}$$

2.7) Area of Parallelogram given Long Edge and Height to Long Edge Formula

Evaluate Formula

Formula

$$A = e_{Long} \cdot h_{Long}$$

Example with Units

$$60\,\text{m}^2 = 12\,\text{m} \cdot 5\,\text{m}$$

2.8) Area of Parallelogram given Short Edge and Height to Short Edge Formula

Evaluate Formula

Formula

$$A = e_{Short} \cdot h_{Short}$$

Example with Units

$$56\,\text{m}^2 = 7\,\text{m} \cdot 8\,\text{m}$$

2.9) Area of Parallelogram given Sides and Obtuse Angle between Sides Formula

Evaluate Formula

Formula

$$A = e_{Long} \cdot e_{Short} \cdot \sin\left(\angle_{Obtuse}\right)$$

Example with Units

$$59.397\,\text{m}^2 = 12\,\text{m} \cdot 7\,\text{m} \cdot \sin\left(135°\right)$$

3) Diagonal of Parallelogram Formulas

3.1) Long Diagonal of Parallelogram Formulas

3.1.1) Long Diagonal of Parallelogram Formula

Evaluate Formula

Formula

$$d_{Long} = \sqrt{\left(2 \cdot e_{Long}^{\,2}\right) + \left(2 \cdot e_{Short}^{\,2}\right) - d_{Short}^{\,2}}$$

Example with Units

$$17.4642\,\text{m} = \sqrt{\left(2 \cdot 12\,\text{m}^{\,2}\right) + \left(2 \cdot 7\,\text{m}^{\,2}\right) - 9\,\text{m}^{\,2}}$$

3.1.2) Long Diagonal of Parallelogram given Area, Short Diagonal and Acute Angle between Diagonals Formula

Evaluate Formula

Formula

$$d_{Long} = \frac{2 \cdot A}{d_{Short} \cdot \sin\left(\angle_{d(Acute)}\right)}$$

Example with Units

$$17.4054\,\text{m} = \frac{2 \cdot 60\,\text{m}^2}{9\,\text{m} \cdot \sin\left(50°\right)}$$

3.1.3) Long Diagonal of Parallelogram given Sides and Acute Angle between Sides Formula

Evaluate Formula

Formula

$$d_{Long} = \sqrt{e_{Long}^2 + e_{Short}^2 + \left(2 \cdot e_{Long} \cdot e_{Short} \cdot \cos\left(\angle_{Acute}\right)\right)}$$

Example with Units

$$17.6577\,\text{m} = \sqrt{12\,\text{m}^2 + 7\,\text{m}^2 + \left(2 \cdot 12\,\text{m} \cdot 7\,\text{m} \cdot \cos\left(45°\right)\right)}$$

3.1.4) Long Diagonal of Parallelogram given Sides and Obtuse Angle between sides Formula

Evaluate Formula

Formula

$$d_{Long} = \sqrt{e_{Long}^2 + e_{Short}^2 - \left(2 \cdot e_{Long} \cdot e_{Short} \cdot \cos\left(\angle_{Obtuse}\right)\right)}$$

Example with Units

$$17.6577\,\text{m} = \sqrt{12\,\text{m}^2 + 7\,\text{m}^2 - \left(2 \cdot 12\,\text{m} \cdot 7\,\text{m} \cdot \cos\left(135°\right)\right)}$$

3.2) Short Diagonal of Parallelogram Formulas

3.2.1) Short Diagonal of Parallelogram Formula

Evaluate Formula

Formula

$$d_{Short} = \sqrt{\left(2 \cdot e_{Long}^2\right) + \left(2 \cdot e_{Short}^2\right) - d_{Long}^2}$$

Example with Units

$$7.874\,\text{m} = \sqrt{\left(2 \cdot 12\,\text{m}^2\right) + \left(2 \cdot 7\,\text{m}^2\right) - 18\,\text{m}^2}$$

3.2.2) Short Diagonal of Parallelogram given Area, Long Diagonal and Obtuse Angle between Diagonals Formula

Evaluate Formula

Formula

$$d_{Short} = \frac{2 \cdot A}{d_{Long} \cdot \sin\left(\angle_{d(Obtuse)}\right)}$$

Example with Units

$$8.7027\,\text{m} = \frac{2 \cdot 60\,\text{m}^2}{18\,\text{m} \cdot \sin\left(130°\right)}$$

3.2.3) Short Diagonal of Parallelogram given Sides and Acute Angle between Sides Formula

Evaluate Formula

Formula

$$d_{Short} = \sqrt{e_{Long}^2 + e_{Short}^2 - \left(2 \cdot e_{Long} \cdot e_{Short} \cdot \cos\left(\angle_{Acute}\right)\right)}$$

Example with Units

$$8.6143\,\text{m} = \sqrt{12\,\text{m}^2 + 7\,\text{m}^2 - \left(2 \cdot 12\,\text{m} \cdot 7\,\text{m} \cdot \cos\left(45°\right)\right)}$$

3.2.4) Short Diagonal of Parallelogram given Sides and Obtuse Angle between Sides Formula

Evaluate Formula

Formula

$$d_{Short} = \sqrt{e_{Long}^{2} + e_{Short}^{2} + \left(2 \cdot e_{Long} \cdot e_{Short} \cdot \cos\left(\angle_{Obtuse}\right)\right)}$$

Example with Units

$$8.6143\,\text{m} = \sqrt{12\,\text{m}^{2} + 7\,\text{m}^{2} + \left(2 \cdot 12\,\text{m} \cdot 7\,\text{m} \cdot \cos\left(135°\right)\right)}$$

4) Perimeter of Parallelogram Formulas

4.1) Perimeter of Parallelogram Formula

Evaluate Formula

Formula

$$P = \left(2 \cdot e_{Long}\right) + \left(2 \cdot e_{Short}\right)$$

Example with Units

$$38\,\text{m} = \left(2 \cdot 12\,\text{m}\right) + \left(2 \cdot 7\,\text{m}\right)$$

4.2) Perimeter of Parallelogram given Diagonals and Long Edge Formula

Evaluate Formula

Formula

$$P = 2 \cdot \left(e_{Long} + \sqrt{\left(\frac{d_{Long}^{2} + d_{Short}^{2}}{2}\right) - e_{Long}^{2}}\right)$$

Example with Units

$$39.2971\,\text{m} = 2 \cdot \left(12\,\text{m} + \sqrt{\left(\frac{18\,\text{m}^{2} + 9\,\text{m}^{2}}{2}\right) - 12\,\text{m}^{2}}\right)$$

5) Side of Parallelogram Formulas

5.1) Long Edge of Parallelogram Formulas

5.1.1) Long Edge of Parallelogram Formula

Evaluate Formula

Formula

$$e_{Long} = \frac{A}{h_{Long}}$$

Example with Units

$$12\,\text{m} = \frac{60\,\text{m}^2}{5\,\text{m}}$$

5.1.2) Long Edge of Parallelogram given Diagonals and Acute Angle between Diagonals Formula

Evaluate Formula

Formula

$$e_{Long} = \frac{1}{2} \cdot \sqrt{d_{Long}^{2} + d_{Short}^{2} + \left(2 \cdot d_{Long} \cdot d_{Short} \cdot \cos\left(\angle_{d(Acute)}\right)\right)}$$

Example with Units

$$12.3821\,\text{m} = \frac{1}{2} \cdot \sqrt{18\,\text{m}^{2} + 9\,\text{m}^{2} + \left(2 \cdot 18\,\text{m} \cdot 9\,\text{m} \cdot \cos\left(50°\right)\right)}$$

5.1.3) Long Edge of Parallelogram given Diagonals and Obtuse Angle between Diagonals Formula

Evaluate Formula

Formula

$$e_{Long} = \frac{1}{2} \cdot \sqrt{d_{Long}^{2} + d_{Short}^{2} - \left(2 \cdot d_{Long} \cdot d_{Short} \cdot \cos\left(\angle_{d(Obtuse)}\right)\right)}$$

Example with Units

$$12.3821\,\text{m} = \frac{1}{2} \cdot \sqrt{18\,\text{m}^{2} + 9\,\text{m}^{2} - \left(2 \cdot 18\,\text{m} \cdot 9\,\text{m} \cdot \cos\left(130°\right)\right)}$$

5.1.4) Long Edge of Parallelogram given Diagonals and Short Edge Formula

Evaluate Formula

Formula

$$e_{Long} = \sqrt{\frac{d_{Long}^{2} + d_{Short}^{2} - \left(2 \cdot e_{Short}^{2}\right)}{2}}$$

Example with Units

$$12.3895\,\text{m} = \sqrt{\frac{18\,\text{m}^{2} + 9\,\text{m}^{2} - \left(2 \cdot 7\,\text{m}^{2}\right)}{2}}$$

5.1.5) Long Edge of Parallelogram given Height to Short Edge and Acute Angle between Sides Formula

Evaluate Formula

Formula

$$e_{Long} = \frac{h_{Short}}{\sin\left(\angle_{Acute}\right)}$$

Example with Units

$$11.3137\,\text{m} = \frac{8\,\text{m}}{\sin\left(45°\right)}$$

5.2) Short Edge of Parallelogram Formulas

5.2.1) Short Edge of Parallelogram Formula

Evaluate Formula

Formula

$$e_{Short} = \frac{A}{h_{Short}}$$

Example with Units

$$7.5\,\text{m} = \frac{60\,\text{m}^{2}}{8\,\text{m}}$$

5.2.2) Short Edge of Parallelogram given Diagonals and Acute Angle between Diagonals Formula

Evaluate Formula

Formula

$$e_{Short} = \frac{1}{2} \cdot \sqrt{d_{Long}^{2} + d_{Short}^{2} - \left(2 \cdot d_{Long} \cdot d_{Short} \cdot \cos\left(\angle_{d(Acute)}\right)\right)}$$

Example with Units

$$7.0131\,\text{m} = \frac{1}{2} \cdot \sqrt{18\,\text{m}^{2} + 9\,\text{m}^{2} - \left(2 \cdot 18\,\text{m} \cdot 9\,\text{m} \cdot \cos\left(50°\right)\right)}$$

5.2.3) Short Edge of Parallelogram given Diagonals and Long Edge Formula

Evaluate Formula

Formula

$$e_{Short} = \sqrt{\frac{d_{Long}^{2} + d_{Short}^{2} - \left(2 \cdot e_{Long}^{2}\right)}{2}}$$

Example with Units

$$7.6485\,\text{m} = \sqrt{\frac{18\,\text{m}^{2} + 9\,\text{m}^{2} - \left(2 \cdot 12\,\text{m}^{2}\right)}{2}}$$

5.2.4) Short Edge of Parallelogram given Diagonals and Obtuse Angle between Diagonals Formula

Evaluate Formula

Formula

$$e_{Short} = \frac{1}{2} \cdot \sqrt{d_{Long}^{2} + d_{Short}^{2} + \left(2 \cdot d_{Long} \cdot d_{Short} \cdot \cos\left(\angle_{d(Obtuse)}\right)\right)}$$

Example with Units

$$7.0131\,\text{m} = \frac{1}{2} \cdot \sqrt{18\,\text{m}^{2} + 9\,\text{m}^{2} + \left(2 \cdot 18\,\text{m} \cdot 9\,\text{m} \cdot \cos\left(130°\right)\right)}$$

5.2.5) Short Edge of Parallelogram given Height to Long Edge and Acute Angle between Sides Formula

Evaluate Formula

Formula

$$e_{Short} = \frac{h_{Long}}{\sin\left(\angle_{Acute}\right)}$$

Example with Units

$$7.0711\,\text{m} = \frac{5\,\text{m}}{\sin\left(45°\right)}$$

Variables used in list of Parallelogram Formulas above

- $\angle_{Acute}$ Acute Angle of Parallelogram *(Degree)*
- $\angle_{d(Acute)}$ Acute Angle between Diagonals of Parallelogram *(Degree)*
- $\angle_{d(Obtuse)}$ Obtuse Angle between Diagonals of Parallelogram *(Degree)*
- $\angle_{Obtuse}$ Obtuse Angle of Parallelogram *(Degree)*
- **A** Area of Parallelogram *(Square Meter)*
- $A_{l(Triangle)}$ Area of Long Diagonal Triangle of Parallelogram *(Square Meter)*
- d_{Long} Long Diagonal of Parallelogram *(Meter)*
- d_{Short} Short Diagonal of Parallelogram *(Meter)*
- e_{Long} Long Edge of Parallelogram *(Meter)*
- e_{Short} Short Edge of Parallelogram *(Meter)*
- h_{Long} Height to Long Edge of Parallelogram *(Meter)*
- h_{Short} Height to Short Edge of Parallelogram *(Meter)*
- **P** Perimeter of Parallelogram *(Meter)*

Constants, Functions, Measurements used in list of Parallelogram Formulas above

- constant(s): **pi**, 3.14159265358979323846264338327950288 *Archimedes' constant*
- Functions: **cos**, cos(Angle) *Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.*
- Functions: **sin**, sin(Angle) *Sine is a trigonometric function that describes the ratio of the length of the opposite side of a right triangle to the length of the hypotenuse.*
- 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: **Area** in Square Meter (m²) *Area Unit Conversion*
- Measurement: **Angle** in Degree (°) *Angle Unit Conversion*

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