Important Formulas of Scalene Triangle PDF



List of 28

Important Formulas of Scalene Triangle

1) Angles of Scalene Triangle Formulas 🕝

1.1) Larger Angle of Scalene Triangle Formula



Evaluate Formula [

$$\angle_{\text{Larger}} = a\cos\left(\frac{S_{\text{Medium}}^2 + S_{\text{Shorter}}^2 - S_{\text{Longer}}^2}{2 \cdot S_{\text{Medium}} \cdot S_{\text{Shorter}}}\right)$$

$$111.8037^{\circ} = a\cos\left(\frac{14\,\mathrm{m}^{2} + 10\,\mathrm{m}^{2} \cdot 20\,\mathrm{m}^{2}}{2 \cdot 14\,\mathrm{m} \cdot 10\,\mathrm{m}}\right)$$

1.2) Larger Angle of Scalene Triangle given other Angles Formula C

Formula
$$\angle_{\text{Larger}} = \pi \cdot \left(\angle_{\text{Medium}} + \angle_{\text{Smaller}} \right)$$

Example with Units
$$110^{\circ} = 3.1416 - (40^{\circ} + 30^{\circ})$$

Evaluate Formula (

Evaluate Formula

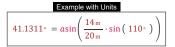
1.3) Medium Angle of Scalene Triangle Formula

Formula
$$\angle_{Medium} = acos \left(\frac{S_{Longer}^{2} + S_{Shorter}^{2} \cdot S_{Medium}^{2}}{2 \cdot S_{Longer} \cdot S_{Shorter}^{2}} \right)$$

$$40.5358^{\circ} = a\cos\left(\frac{20\,\text{m}^{2} + 10\,\text{m}^{2} - 14\,\text{m}^{2}}{2 \cdot 20\,\text{m} \cdot 10\,\text{m}}\right)$$

1.4) Medium Angle of Scalene Triangle given Longer Side, Medium Side and Larger Angle Formula 🕝

Formula



Evaluate Formula @

Evaluate Formula

Evaluate Formula C

1.5) Smaller Angle of Scalene Triangle Formula 🕝

Formula

$$27.6604^{\circ} = a\cos\left(\frac{20\,\mathrm{m}^{2} + 14\,\mathrm{m}^{2} - 10\,\mathrm{m}^{2}}{2 \cdot 20\,\mathrm{m} \cdot 14\,\mathrm{m}}\right)$$

1.6) Smaller Angle of Scalene Triangle given Medium Side, Shorter Side and Medium Angle Formula 🗂

 $\angle_{Smaller} = a sin \left(\frac{S_{Shorter}}{S_{Medium}} \cdot sin \left(\angle_{Medium} \right) \right)$

$$27.3312^{\circ} = a \sin \left(\frac{10 \,\mathrm{m}}{14 \,\mathrm{m}} \cdot \sin \left(40^{\circ} \right) \right)$$

2) Area of Scalene Triangle Formulas (

2.1) Area of Scalene Triangle Formula 🗂

Formula

 $A = \frac{\sqrt{\left(S_{Longer} + S_{Medium} + S_{Shorter}\right) \cdot \left(S_{Medium} + S_{Shorter} - S_{Longer}\right) \cdot \left(S_{Longer} + S_{Shorter} - S_{Medium}\right) \cdot \left(S_{Longer} + S_{Medium} - S_{Shorter}\right)}}{\left(S_{Longer} + S_{Medium}\right) \cdot \left(S_{Longer} + S_{Medium}\right) \cdot \left(S_{Longer}\right) \cdot \left$

Example with Units

$$64.9923 \, \text{m}^2 = \frac{\sqrt{\left(20 \, \text{m} + 14 \, \text{m} + 10 \, \text{m}\,\right) \cdot \left(14 \, \text{m} + 10 \, \text{m} - 20 \, \text{m}\,\right) \cdot \left(20 \, \text{m} + 10 \, \text{m} - 14 \, \text{m}\,\right) \cdot \left(20 \, \text{m} + 14 \, \text{m} - 10 \, \text{m}\,\right)}}{4}$$

2.2) Area of Scalene Triangle given Larger Angle and Adjacent Sides Formula 🗂

$$A = \frac{S_{Medium} \cdot S_{Shorter} \cdot \sin\left(\angle_{Larger}\right)}{2} \qquad \boxed{65.7785_{m^2} = \frac{14_m \cdot 10_m \cdot \sin\left(110^{\circ}\right)}{2}}$$

2.3) Area of Scalene Triangle given Medium Angle and Adjacent Sides Formula 🗂

 $A = \frac{S_{Longer} \cdot S_{Shorter} \cdot sin(\angle_{Medium})}{2}$

2.4) Area of Scalene Triangle given Smaller Angle and Adjacent Sides Formula 🕝

3) Circumcircle of Scalene Triangle Formulas 🗂

3.1) Area of Circumcircle of Scalene Triangle given Shorter Side and Smaller Angle Formula 🕝

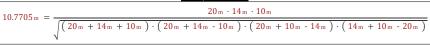
 $A_{Circumcircle} = \frac{\pi}{4} \cdot \left(\frac{S_{Shorter}}{\sin\left(\angle_{Smaller}\right)} \right)^2 \left| \begin{array}{c} 314.1593\,\text{m}^2 = \overline{\frac{3.1416}{4} \cdot \left(\frac{10\,\text{m}}{\sin\left(30^\circ\right)}\right)^2} \end{array} \right|$

3.2) Circumference of Circumcircle of Scalene Triangle given Medium Side and Medium Angle Formula 🗂

 $C_{Circumcircle} = \pi \cdot \frac{S_{Medium}}{\sin\left(\angle_{Medium}\right)} \left| \quad | \quad 68.4243 \,\text{m} = 3.1416 \cdot \frac{14 \,\text{m}}{\sin\left(40^{\circ}\right)} \right|$

3.3) Circumradius of Scalene Triangle Formula

 $\frac{S_{Longer} \cdot S_{Medium} \cdot S_{Shorter}}{\sqrt{\left(S_{Longer} + S_{Medium} + S_{Shorter}\right) \cdot \left(S_{Longer} + S_{Medium} - S_{Shorter}\right) \cdot \left(S_{Longer} + S_{Shorter} - S_{Medium}\right) \cdot \left(S_{Medium} + S_{Shorter} - S_{Longer}\right)}}$



Evaluate Formula [

Evaluate Formula

Evaluate Formula

Evaluate Formula (

Evaluate Formula (

Evaluate Formula

3.4) Circumradius of Scalene Triangle given Longer Side and Larger Angle Formula 🕝

$$r_{c} = \frac{S_{Longer}}{2 \cdot sin\left(\angle_{Larger}\right)}$$

$$r_{c} = \frac{S_{Longer}}{2 \cdot \sin\left(\angle_{Larger} \right)} \boxed{10.6418_{m} = \frac{20_{m}}{2 \cdot \sin\left(110^{\circ} \right)}}$$

4) Heights of Scalene Triangle Formulas 🗂

4.1) Height on Longer Side of Scalene Triangle given Medium Side and Smaller Angle Formula 🕝





4.2) Height on Medium Side of Scalene Triangle given Shorter Side and Larger Angle Formula 🗂

Example with Units
$$3969_{\rm m} = 10_{\rm m} \cdot \sin(110^{\circ})$$

Evaluate Formula (

4.3) Height on Shorter Side of Scalene Triangle given Longer Side and Medium Angle Formula 🕝

Example with Units
$$12.8558 \,\mathrm{m} = 20 \,\mathrm{m} \cdot \sin \left(40^{\circ} \right)$$

Evaluate Formula 🕝

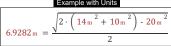
Evaluate Formula

Evaluate Formula

Evaluate Formula

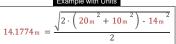
5) Medians of Scalene Triangle Formulas

5.1) Median on Longer Side of Scalene Triangle given Three Sides Formula C



5.2) Median on Medium Side of Scalene Triangle given Three Sides Formula C

2 · (S_{Longer} + S_{Shorter}



5.3) Median on Shorter Side of Scalene Triangle given Three Sides Formula

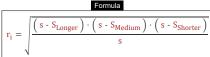
$2 \cdot \left(S_{\text{Longer}}^2 + S_{\text{Medium}}^2 \right)$

$$16.5227_{\text{m}} = \frac{\sqrt{2 \cdot \left(20_{\text{m}}^2 + 14_{\text{m}}^2\right) - 10_{\text{m}}^2}}{2}$$

Evaluate Formula

6) Other Formulas of Scalene Triangle Formulas 🗂

6.1) Inradius of Scalene Triangle by Heron's Formula Formula C



$$2.9542_{m} = \sqrt{\frac{(22_{m} - 20_{m}) \cdot (22_{m} - 14_{m}) \cdot (22_{m} - 10_{m})}{22_{m}}}$$

6.2) Perimeter of Scalene Triangle Formula C

 $P = S_{Longer} + S_{Medium} + S_{Shorter}$ 44m = 20m + 14m + 10m

Evaluate Formula

7) Sides of Scalene Triangle Formulas 🗗

7.1) Longer Side of Scalene Triangle given Larger Angle and other Sides Formula C

$$S_{Longer} = \sqrt{S_{Medium}}^2 + S_{Shorter}^2 - 2 \cdot S_{Medium} \cdot S_{Shorter} \cdot \cos(\angle_{Larger})$$

Evaluate Formula

Example with Units
$$19.7931_{\,m} \, = \, \sqrt{14_{\,m}^{\,\,\,2} + 10_{\,m}^{\,\,2} - 2 \cdot 14_{\,m} \cdot 10_{\,m} \cdot \cos\left(\,110^{\,\circ}\,\right)}$$

7.2) Longer Side of Scalene Triangle given Larger Angle, Medium Angle and Medium Side Formula 🕝

$$S_{Longer} = S_{Medium} \cdot \frac{\sin\left(\angle_{Larger}\right)}{\sin\left(\angle_{Medium}\right)}$$

$$20.4666_{m} = 14_{m} \cdot \frac{\sin\left(110^{\circ}\right)}{\sin\left(40^{\circ}\right)}$$

$$20.4666m = 14m \cdot \frac{\sin(110^{\circ})}{\sin(40^{\circ})}$$

7.3) Medium Side of Scalene Triangle given Medium Angle and other Sides Formula 🗂

$$\boxed{S_{\text{Medium}} = \sqrt{{S_{\text{Longer}}}^2 + {S_{\text{Shorter}}}^2 - 2 \cdot S_{\text{Longer}} \cdot S_{\text{Shorter}} \cdot \cos\left(\angle_{\text{Medium}}\right)}$$

Evaluate Formula

$$13.9134_{\text{m}} = \sqrt{20_{\text{m}}^2 + 10_{\text{m}}^2 - 2 \cdot 20_{\text{m}} \cdot 10_{\text{m}} \cdot \cos(40^{\circ})}$$

7.4) Medium Side of Scalene Triangle given Medium Angle, Smaller Angle and Shorter Side Formula 🗂

$$S_{\text{Medium}} = S_{\text{Shorter}} \cdot \frac{\sin(\angle_{\text{Medium}})}{\sin(\angle_{\text{Smaller}})} \left[12.8558_{\text{m}} = 10_{\text{m}} \cdot \frac{\sin(40^{\circ})}{\sin(30^{\circ})} \right]$$

$$2.8558 \,\mathrm{m} = 10 \,\mathrm{m} \cdot \frac{\sin\left(40^{\circ}\right)}{\sin\left(30^{\circ}\right)}$$

7.5) Shorter Side of Scalene Triangle given Smaller Angle and other Sides Formula 🕝

$$S_{Shorter} = \sqrt{S_{Longer}^{2} + S_{Medium}^{2}^{2} - 2 \cdot S_{Longer} \cdot S_{Medium} \cdot \cos(\angle_{Smaller})}$$

Evaluate Formula [

Evaluate Formula

Example with Units
$$10.5369_{\,m}\,=\,\sqrt{20_{\,m}^{\,\,2}+\,14_{\,m}^{\,\,2}\cdot2\cdot20_{\,m}\,\cdot14_{\,m}\,\cdot\cos\left(\,30^{\circ}\,\right)}$$

7.6) Shorter Side of Scalene Triangle given Smaller Angle, Larger Angle and Longer Side Formula 🗂

$$S_{Shorter} = S_{Longer} \cdot \frac{\sin(\angle_{Smaller})}{\sin(\angle_{Larger})}$$

$$10.6418_{m} = 20_{m} \cdot \frac{\sin(30^{\circ})}{\sin(110^{\circ})}$$

Variables used in list of Important Formulas of Scalene Triangle above

- ∠_{Larger} Larger Angle of Scalene Triangle (Degree)
- ∠ Medium Medium Angle of Scalene Triangle (Degree)
- ∠Smaller Smaller Angle of Scalene Triangle (Degree)
- A Area of Scalene Triangle (Square Meter)
- Acircumcircle Area of Circumcircle of Scalene Triangle (Square Meter)
- Ccircumcircle Circumference of Circumcircle of Scalene
 Triangle (Meter)
- h_{Longer} Height on Longer Side of Scalene Triangle (Meter)
- h_{Medium} Height on Medium Side of Scalene Triangle (Meter)
- hShorter Height on Shorter Side of Scalene Triangle (Meter)
- M_{Longer} Median on Longer Side of Scalene Triangle (Meter)
- M_{Medium} Median on Medium Side of Scalene Triangle (Meter)
- M_{Shorter} Median on Shorter Side of Scalene Triangle (Meter)
- P Perimeter of Scalene Triangle (Meter)
- r_c Circumradius of Scalene Triangle (Meter)
- r_i Inradius of Scalene Triangle (Meter)
- S Semiperimeter of Scalene Triangle (Meter)
- SLonger Longer Side of Scalene Triangle (Meter)
- S_{Medium} Medium Side of Scalene Triangle (Meter)
- Shorter Shorter Side of Scalene Triangle (Meter)

Constants, Functions, Measurements used in list of Important Formulas of Scalene Triangle above

- constant(s): pi, 3.14159265358979323846264338327950288
 Archimedes' constant
- Functions: acos, acos(Number)

The inverse cosine function, is the inverse function of the cosine function. It is the function that takes a ratio as an input and returns the angle whose cosine is equal to that ratio.

• Functions: asin, asin(Number)

The inverse sine function, is a trigonometric function that takes a ratio of two sides of a right triangle and outputs the angle opposite the side with the given ratio.

- 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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