

Important Product to Sum, Sum to Product, Sum & Difference Trigonometry Identities Formulas PDF



Formulas
Examples
with Units

List of 24

Important Product to Sum, Sum to Product, Sum & Difference Trigonometry Identities Formulas

1) Product to Sum Trigonometry Identities Formulas

1.1) Cos A Cos B Formula

Formula

Evaluate Formula

$$\cos A \cos B = \frac{\cos(A + B) + \cos(A - B)}{2}$$

Example with Units

$$0.8138 = \frac{\cos(20^\circ + 30^\circ) + \cos(20^\circ - 30^\circ)}{2}$$

1.2) Cos A Sin B Formula

Formula

Evaluate Formula

$$\cos A \sin B = \frac{\sin(A + B) - \sin(A - B)}{2}$$

Example with Units

$$0.4698 = \frac{\sin(20^\circ + 30^\circ) - \sin(20^\circ - 30^\circ)}{2}$$

1.3) Sin A Cos B Formula

Formula

Evaluate Formula

$$\sin A \cos B = \frac{\sin(A + B) + \sin(A - B)}{2}$$

Example with Units

$$0.2962 = \frac{\sin(20^\circ + 30^\circ) + \sin(20^\circ - 30^\circ)}{2}$$

1.4) Sin A Sin B Formula

Formula

Evaluate Formula

$$\sin A \sin B = \frac{\cos(A - B) - \cos(A + B)}{2}$$

Example with Units

$$0.171 = \frac{\cos(20^\circ - 30^\circ) - \cos(20^\circ + 30^\circ)}{2}$$



2) Sum & Difference Trigonometry Identities Formulas

2.1) Cos (A+B) Formula

Formula

$$\cos_{(A+B)} = (\cos A \cdot \cos B) - (\sin A \cdot \sin B)$$

Example

$$0.6478 = (0.94 \cdot 0.87) - (0.34 \cdot 0.5)$$

Evaluate Formula 

2.2) Cos (A+B+C) Formula

Formula

$$\cos_{(A+B+C)} = (\cos A \cdot \cos B \cdot \cos C) - (\cos A \cdot \sin B \cdot \sin C) - (\sin A \cdot \cos B \cdot \sin C) - (\sin A \cdot \sin B \cdot \cos C)$$

Example

$$0.199 = (0.94 \cdot 0.87 \cdot 0.65) - (0.94 \cdot 0.5 \cdot 0.29) - (0.34 \cdot 0.87 \cdot 0.29) - (0.34 \cdot 0.5 \cdot 0.65)$$

Evaluate Formula 

2.3) Cos (A-B) Formula

Formula

$$\cos_{(A-B)} = (\cos A \cdot \cos B) + (\sin A \cdot \sin B)$$

Example

$$0.9878 = (0.94 \cdot 0.87) + (0.34 \cdot 0.5)$$

Evaluate Formula 

2.4) Cot (A+B) Formula

Formula

$$\cot_{(A+B)} = \frac{(\cot B \cdot \cot A) - 1}{\cot B + \cot A}$$

Example

$$0.8387 = \frac{(1.73 \cdot 2.75) - 1}{1.73 + 2.75}$$

Evaluate Formula 

2.5) Cot (A+B+C) Formula

Formula

$$\cot_{(A+B+C)} = \frac{(\cot A \cdot \cot B \cdot \cot C) - \cot A - \cot B - \cot C}{(\cot A \cdot \cot B) + (\cot B \cdot \cot C) + (\cot A \cdot \cot C)}$$

Example

$$0.1982 = \frac{(2.75 \cdot 1.73 \cdot 1.89) - 2.75 - 1.73 - 1.89}{(2.75 \cdot 1.73) + (1.73 \cdot 1.89) + (2.75 \cdot 1.89)}$$

Evaluate Formula 

2.6) Cot (A-B) Formula

Formula

$$\cot_{(A-B)} = \frac{(\cot B \cdot \cot A) + 1}{\cot B - \cot A}$$

Example

$$-5.6446 = \frac{(1.73 \cdot 2.75) + 1}{1.73 - 2.75}$$

Evaluate Formula 

2.7) Sin (A+B) Formula

Formula

$$\sin_{(A+B)} = (\sin A \cdot \cos B) + (\cos A \cdot \sin B)$$

Example

$$0.7658 = (0.34 \cdot 0.87) + (0.94 \cdot 0.5)$$

Evaluate Formula 



2.8) Sin (A+B+C) Formula ↻

[Evaluate Formula ↻](#)**Formula**

$$\sin_{(A+B+C)} = (\sin A \cdot \cos B \cdot \cos C) + (\cos A \cdot \sin B \cdot \cos C) + (\cos A \cdot \cos B \cdot \sin C) - (\sin A \cdot \sin B \cdot \sin C)$$

Example

$$0.6856 = (0.34 \cdot 0.87 \cdot 0.65) + (0.94 \cdot 0.5 \cdot 0.65) + (0.94 \cdot 0.87 \cdot 0.29) - (0.34 \cdot 0.5 \cdot 0.29)$$

2.9) Sin (A-B) Formula ↻

[Evaluate Formula ↻](#)**Formula**

$$\sin_{(A-B)} = (\sin A \cdot \cos B) - (\cos A \cdot \sin B)$$

Example

$$-0.1742 = (0.34 \cdot 0.87) - (0.94 \cdot 0.5)$$

2.10) Tan (A+B) Formula ↻

[Evaluate Formula ↻](#)**Formula**

$$\tan_{(A+B)} = \frac{\tan A + \tan B}{1 - (\tan A \cdot \tan B)}$$

Example

$$1.1881 = \frac{0.36 + 0.58}{1 - (0.36 \cdot 0.58)}$$

2.11) Tan (A+B+C) Formula ↻

[Evaluate Formula ↻](#)**Formula**

$$\tan_{(A+B+C)} = \frac{\tan A + \tan B + \tan C - (\tan A \cdot \tan B \cdot \tan C)}{1 - (\tan A \cdot \tan B) - (\tan B \cdot \tan C) - (\tan A \cdot \tan C)}$$

Example

$$1.4932 = \frac{0.36 + 0.58 + 0.11 - (0.36 \cdot 0.58 \cdot 0.11)}{1 - (0.36 \cdot 0.58) - (0.58 \cdot 0.11) - (0.36 \cdot 0.11)}$$

2.12) Tan (A-B) Formula ↻

[Evaluate Formula ↻](#)**Formula**

$$\tan_{(A-B)} = \frac{\tan A - \tan B}{1 + (\tan A \cdot \tan B)}$$

Example

$$-0.182 = \frac{0.36 - 0.58}{1 + (0.36 \cdot 0.58)}$$

3) Sum to Product Trigonometry Identities Formulas ↻

3.1) Cos A - Cos B Formula ↻

[Evaluate Formula ↻](#)**Formula**

$$\cos A - \cos B = -2 \cdot \sin\left(\frac{A+B}{2}\right) \cdot \sin\left(\frac{A-B}{2}\right)$$

Example with Units

$$0.0737 = -2 \cdot \sin\left(\frac{20^\circ + 30^\circ}{2}\right) \cdot \sin\left(\frac{20^\circ - 30^\circ}{2}\right)$$



3.2) Cos A + Cos B Formula

Formula

$$\cos A + \cos B = 2 \cdot \cos\left(\frac{A+B}{2}\right) \cdot \cos\left(\frac{A-B}{2}\right)$$

Evaluate Formula 

Example with Units

$$1.8057 = 2 \cdot \cos\left(\frac{20^\circ + 30^\circ}{2}\right) \cdot \cos\left(\frac{20^\circ - 30^\circ}{2}\right)$$

3.3) Cot A - Cot B Formula

Formula

$$\cot A - \cot B = - \frac{\sin A \cdot \cos B - \cos A \cdot \sin B}{\sin A \cdot \sin B}$$

Example

$$1.0247 = - \frac{0.34 \cdot 0.87 - 0.94 \cdot 0.5}{0.34 \cdot 0.5}$$

Evaluate Formula 

3.4) Cot A + Cot B Formula

Formula

$$\cot A + \cot B = \frac{\sin(A+B)}{\sin A \cdot \sin B}$$

Example

$$4.5294 = \frac{0.77}{0.34 \cdot 0.5}$$

Evaluate Formula 

3.5) Sin A - Sin B Formula

Formula

$$\sin A - \sin B = 2 \cdot \cos\left(\frac{A+B}{2}\right) \cdot \sin\left(\frac{A-B}{2}\right)$$

Evaluate Formula 

Example with Units

$$-0.158 = 2 \cdot \cos\left(\frac{20^\circ + 30^\circ}{2}\right) \cdot \sin\left(\frac{20^\circ - 30^\circ}{2}\right)$$

3.6) Sin A + Sin B Formula

Formula

$$\sin A + \sin B = 2 \cdot \sin\left(\frac{A+B}{2}\right) \cdot \cos\left(\frac{A-B}{2}\right)$$

Evaluate Formula 

Example with Units

$$0.842 = 2 \cdot \sin\left(\frac{20^\circ + 30^\circ}{2}\right) \cdot \cos\left(\frac{20^\circ - 30^\circ}{2}\right)$$

3.7) Tan A - Tan B Formula

Formula

$$\tan A - \tan B = \frac{\sin(A-B)}{\cos A \cdot \cos B}$$

Example

$$-0.2079 = \frac{-0.17}{0.94 \cdot 0.87}$$

Evaluate Formula 



3.8) Tan A + Tan B Formula

Formula

$$\tan A + \tan B = \frac{\sin(A+B)}{\cos A \cdot \cos B}$$

Example

$$0.9416 = \frac{0.77}{0.94 \cdot 0.87}$$

Evaluate Formula 



Variables used in list of Product to Sum, Sum to Product, Sum & Difference Trigonometry Identities Formulas above

- **A** Angle A of Trigonometry (Degree)
- **B** Angle B of Trigonometry (Degree)
- **cos A** Cos A
- **cos A sin B** Cos A Sin B
- **cos A + cos B** Cos A + Cos B
- **cos A – cos B** Cos A - Cos B
- **cos A cos B** Cos A Cos B
- **cos B** Cos B
- **cos C** Cos C
- **cos_(A+B)** Cos (A+B)
- **cos_(A+B+C)** Cos (A+B+C)
- **cos_(A-B)** Cos (A-B)
- **cot A** Cot A
- **Cot A _ Cot B** Cot A - Cot B
- **Cot A + Cot B** Cot A + Cot B
- **cot B** Cot B
- **cot C** Cot C
- **cot_(A+B)** Cot (A+B)
- **cot_(A+B+C)** Cot (A+B+C)
- **cot_(A-B)** Cot (A-B)
- **sin A** Sin A
- **sin A cos B** Sin A Cos B
- **sin A sin B** Sin A Sin B
- **sin A + sin B** Sin A + Sin B
- **sin A – sin B** Sin A - Sin B
- **sin B** Sin B
- **sin C** Sin C
- **sin_(A+B)** Sin (A+B)
- **sin_(A+B+C)** Sin (A+B+C)
- **sin_(A-B)** Sin (A-B)
- **tan A** Tan A
- **Tan A _ Tan B** Tan A - Tan B

Constants, Functions, Measurements used in list of Product to Sum, Sum to Product, Sum & Difference Trigonometry Identities Formulas above

- **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.
- **Measurement: Angle** in Degree (°)
Angle Unit Conversion 



- **Tan A + Tan B** Tan A + Tan B
- **tan B** Tan B
- **tan C** Tan C
- **tan_(A+B)** Tan (A+B)
- **tan_(A+B+C)** Tan (A+B+C)
- **tan_(A-B)** Tan (A-B)



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