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

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List of 24 Product to Sum, Sum to Product, Sum & Difference Trigonometry Identities Formulas

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

Product to Sum Trigonometry Identities

1) Cos A Cos B

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

[Open Calculator !\[\]\(de95854c7ee024cfadc48187bbb781b2_img.jpg\)](#)

$$\text{ex } 0.813798 = \frac{\cos(20^\circ + 30^\circ) + \cos(20^\circ - 30^\circ)}{2}$$

2) Cos A Sin B

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

[Open Calculator !\[\]\(6a9b39b98eb945faa14c645ec99e4eaa_img.jpg\)](#)

$$\text{ex } 0.469846 = \frac{\sin(20^\circ + 30^\circ) - \sin(20^\circ - 30^\circ)}{2}$$

3) Sin A Cos B

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

[Open Calculator !\[\]\(f1c5da15572e3e09d343161be98f508d_img.jpg\)](#)

$$\text{ex } 0.296198 = \frac{\sin(20^\circ + 30^\circ) + \sin(20^\circ - 30^\circ)}{2}$$

4) Sin A Sin B

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

[Open Calculator !\[\]\(166772600a13ad0a433053f90fe45649_img.jpg\)](#)

$$\text{ex } 0.17101 = \frac{\cos(20^\circ - 30^\circ) - \cos(20^\circ + 30^\circ)}{2}$$



Sum & Difference Trigonometry Identities

5) Cos (A+B)

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

Open Calculator 

$$\text{ex } 0.6478 = (0.94 \cdot 0.87) - (0.34 \cdot 0.5)$$

6) Cos (A+B+C)

fx

Open Calculator 

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

$$\text{ex } 0.198988 = (0.94 \cdot 0.87 \cdot 0.65) - (0.94 \cdot 0.5 \cdot 0.29) - (0.34 \cdot 0.87 \cdot 0.29) - (0.34 \cdot 0.5 \cdot 0.65)$$

7) Cos (A-B)

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

Open Calculator 

$$\text{ex } 0.9878 = (0.94 \cdot 0.87) + (0.34 \cdot 0.5)$$

8) Cot (A+B)

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

Open Calculator 

$$\text{ex } 0.838728 = \frac{(1.73 \cdot 2.75) - 1}{1.73 + 2.75}$$

9) Cot (A+B+C)

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

Open Calculator 

$$\text{ex } 0.198241 = \frac{(2.75 \cdot 1.73 \cdot 1.89) - 2.75 - 1.73 - 1.89}{(2.75 \cdot 1.73) + (1.73 \cdot 1.89) + (2.75 \cdot 1.89)}$$


10) Cot (A-B)

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

Open Calculator 

$$\text{ex } -5.644608 = \frac{(1.73 \cdot 2.75) + 1}{1.73 - 2.75}$$




11) Sin (A+B) 

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

Open Calculator 


$$\text{ex } 0.7658 = (0.34 \cdot 0.87) + (0.94 \cdot 0.5)$$

12) Sin (A+B+C) 

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

Open Calculator 


$$\text{ex } 0.685632 = (0.34 \cdot 0.87 \cdot 0.65) + (0.94 \cdot 0.5 \cdot 0.65) + (0.94 \cdot 0.87 \cdot 0.29) - (0.34 \cdot 0.5 \cdot 0.29)$$

13) Sin (A-B) 

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

Open Calculator 


$$\text{ex } -0.1742 = (0.34 \cdot 0.87) - (0.94 \cdot 0.5)$$

14) Tan (A+B) 

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

Open Calculator 

$$\text{ex } 1.188069 = \frac{0.36 + 0.58}{1 - (0.36 \cdot 0.58)}$$

15) Tan (A+B+C) 

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

Open Calculator 

$$\text{ex } 1.493213 = \frac{0.36 + 0.58 + 0.11 - (0.36 \cdot 0.58 \cdot 0.11)}{1 - (0.36 \cdot 0.58) - (0.58 \cdot 0.11) - (0.36 \cdot 0.11)}$$

16) Tan (A-B) 

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

Open Calculator 

$$\text{ex } -0.181999 = \frac{0.36 - 0.58}{1 + (0.36 \cdot 0.58)}$$



Sum to Product Trigonometry Identities

17) Cos A - Cos B

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

Open Calculator 

$$\text{ex } 0.073667 = -2 \cdot \sin\left(\frac{20^\circ + 30^\circ}{2}\right) \cdot \sin\left(\frac{20^\circ - 30^\circ}{2}\right)$$

18) Cos A + Cos B

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

Open Calculator 

$$\text{ex } 1.805718 = 2 \cdot \cos\left(\frac{20^\circ + 30^\circ}{2}\right) \cdot \cos\left(\frac{20^\circ - 30^\circ}{2}\right)$$

19) Cot A - Cot B

$$\text{fx } (\cot A - \cot B) = -\frac{\sin A \cdot \cos B - \cos A \cdot \sin B}{\sin A \cdot \sin B}$$

Open Calculator 

$$\text{ex } 1.024706 = -\frac{0.34 \cdot 0.87 - 0.94 \cdot 0.5}{0.34 \cdot 0.5}$$

20) Cot A + Cot B

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

Open Calculator 

$$\text{ex } 4.529412 = \frac{0.77}{0.34 \cdot 0.5}$$

21) Sin A - Sin B

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

Open Calculator 

$$\text{ex } -0.15798 = 2 \cdot \cos\left(\frac{20^\circ + 30^\circ}{2}\right) \cdot \sin\left(\frac{20^\circ - 30^\circ}{2}\right)$$



22) Sin A + Sin B 

Open Calculator 

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


$$\text{ex } 0.84202 = 2 \cdot \sin\left(\frac{20^\circ + 30^\circ}{2}\right) \cdot \cos\left(\frac{20^\circ - 30^\circ}{2}\right)$$

23) Tan A - Tan B 

Open Calculator 

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

$$\text{ex } -0.207875 = \frac{-0.17}{0.94 \cdot 0.87}$$

24) Tan A + Tan B 

Open Calculator 

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

$$\text{ex } 0.941551 = \frac{0.77}{0.94 \cdot 0.87}$$



Variables Used


- **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
- **Tan A + Tan B** Tan A + Tan B
- **tan B** Tan B



- $\tan C$ $\tan C$
- $\tan_{(A+B)}$ $\tan (A+B)$
- $\tan_{(A+B+C)}$ $\tan (A+B+C)$
- $\tan_{(A-B)}$ $\tan (A-B)$







Constants, Functions, Measurements used

- **Function: \cos** , $\cos(\text{Angle})$
Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.
- **Function: \sin** , $\sin(\text{Angle})$
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 ($^{\circ}$)
Angle Unit Conversion 



Check other formula lists

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