삼각함수의 2배각 공식
(Double Angle Formula for Trigonometric Functions)

Double Angle Formula for Trigonometric Functions

Start End

Double Angle Formula for Trigonometric Functions

Start End

$$\sin 2\alpha \quad =$$

Double Angle Formula for Trigonometric Functions

Start End

$$\sin 2\alpha = 2\sin\alpha\cos\alpha$$

Double Angle Formula for Trigonometric Functions

Start End

$$\sin 2\alpha = 2\sin\alpha\cos\alpha$$

proof

$$\cos 2\alpha =$$

Double Angle Formula for Trigonometric Functions

Start End

$$\sin 2\alpha = 2\sin\alpha\cos\alpha$$

proof

$$\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$$
$$=$$

Double Angle Formula for Trigonometric Functions

Start End

$$\sin 2\alpha = 2\sin\alpha\cos\alpha$$

proof

$$\begin{aligned}\cos 2\alpha &= \cos^2\alpha - \sin^2\alpha \\ &= 2\cos^2\alpha - 1\end{aligned}$$

Double Angle Formula for Trigonometric Functions

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Double Angle Formula for Trigonometric Functions

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$$\tan 2\alpha =$$

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$$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha}$$

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proof

Double Angle Formula for Trigonometric Functions

Double Angle Formula for Trigonometric Functions

$$\sin 2\alpha \quad =$$

Double Angle Formula for Trigonometric Functions

$$\sin 2\alpha = \sin(\alpha + \alpha)$$

Double Angle Formula for Trigonometric Functions

$$\begin{aligned} \sin 2\alpha &= \sin(\alpha + \alpha) \\ &= \end{aligned}$$

Double Angle Formula for Trigonometric Functions

$$\begin{aligned} \sin 2\alpha &= \sin(\alpha + \alpha) \\ &= \sin\alpha\cos\alpha + \cos\alpha\sin\alpha \end{aligned}$$

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Double Angle Formula for Trigonometric Functions

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\sin 2\alpha &= \sin(\alpha + \alpha) \\
&= \sin\alpha\cos\alpha + \cos\alpha\sin\alpha \\
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\end{aligned}$$

Double Angle Formula for Trigonometric Functions

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&= \sin\alpha\cos\alpha + \cos\alpha\sin\alpha \\
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&= 2\sin\alpha\cos\alpha
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Double Angle Formula for Trigonometric Functions

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$$\cos 2\alpha \quad =$$

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Double Angle Formula for Trigonometric Functions

$$\begin{aligned} \cos 2\alpha &= \cos(\alpha + \alpha) \\ &= \cos\alpha \cos\alpha - \sin\alpha \sin\alpha \end{aligned}$$

Double Angle Formula for Trigonometric Functions

$$\begin{aligned}\cos 2\alpha &= \cos(\alpha+\alpha)\\ &= \cos\alpha\cos\alpha-\sin\alpha\sin\alpha\\ &=\end{aligned}$$

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&= \cos^2\alpha - (1 - \cos^2\alpha)
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\therefore \cos 2\alpha = \cos^2\alpha - \sin^2\alpha
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Double Angle Formula for Trigonometric Functions

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$$\tan 2\alpha \quad =$$

Double Angle Formula for Trigonometric Functions

$$\tan 2\alpha = \tan(\alpha + \alpha)$$

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$$\begin{aligned} \tan 2\alpha &= \tan(\alpha + \alpha) \\ &= \frac{\tan\alpha + \tan\alpha}{1 - \tan\alpha \tan\alpha} \end{aligned}$$

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\therefore \tan 2\alpha &= \frac{2\tan\alpha}{1 - \tan^2\alpha}
\end{aligned}
$$

Github:
https://min7014.github.io/math20230419001.html

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and you can see a picture moving.