

Simplifier les expressions suivantes :

1. $\sin x \cos x \tan x$

2. $\frac{\tan x}{\cot ax}$

3. $\sin x \sec x \cot x$

4. $1 - \frac{\tan^2 x}{\sec^2 x}$

5. $\frac{\sin^2 x}{\tan x} \operatorname{cosec} x$

6. $\sin^2 x(1 - \sin^2 x) \tan^2 x(\operatorname{cosec}^2 x - 1) \sec^2 x \operatorname{cosec} x$

7. $\sec^2 x(\cos^2 x - 1)$

8. $(1 - \cos^2 x)(1 + \tan^2 x)(1 - \operatorname{cosec}^2 x)$

Solutionnaire

Simplifier les expressions suivantes :

1. $\sin x \cos x \tan x$

$$\sin x \cos x \tan x = \sin x \cos x \frac{\sin x}{\cos x} = \sin^2 x$$

2. $\frac{\tan x}{\cot ax}$

$$\frac{\tan x}{\cot ax} = \frac{\frac{\sin x}{\cos x}}{\frac{\cos x}{\sin x}} = \frac{\sin^2 x}{\cos^2 x} = \tan^2 x$$

3. $\sin x \sec x \cot ax$

$$\sin x \sec x \cot ax = \sin x \frac{1}{\cos x} \frac{\cos x}{\sin x} = 1$$

4. $1 - \frac{\tan^2 x}{\sec^2 x}$

$$1 - \frac{\tan^2 x}{\sec^2 x} = 1 - \frac{\frac{\sin^2 x}{\cos^2 x}}{\frac{1}{\cos^2 x}} = 1 - \sin^2 x = \cos^2 x$$

5. $\frac{\sin^2 x}{\tan x} \cos ecx$

$$\frac{\sin^2 x}{\tan x} \cos ecx = \frac{\sin^2 x}{\frac{\sin x}{\cos x}} \times \frac{1}{\sin x} = \sin x \cos x \frac{1}{\sin x} = \cos x$$

6. $\sin^2 x(1 - \sin^2 x) \tan^2 x(\cos ec^2 x - 1) \sec^2 x \cos ecx$

$$\sin^2 x(1 - \sin^2 x) \tan^2 x(\cos ec^2 x - 1) \sec^2 x \cos ecx = \sin^2 x \cos^2 x \frac{\sin^2 x}{\cos^2 x} \cot an^2 x \frac{1}{\cos^2 x} \frac{1}{\sin x}$$

$$\sin^2 x \cancel{\cos^2 x} \frac{\sin^2 x}{\cancel{\cos^2 x}} \cot an^2 x \frac{1}{\cos^2 x} \frac{1}{\sin x} = \sin^2 x \sin^2 x \frac{\cos^2 x}{\sin^2 x} \frac{1}{\cos^2 x} \frac{1}{\sin x}$$

$$\sin^2 x \cancel{\sin^2 x} \frac{\cancel{\cos^2 x}}{\cancel{\sin^2 x}} \frac{1}{\cos^2 x} \frac{1}{\sin x} = \sin^2 x \frac{1}{\sin x} = \sin x$$

$$7. \sec^2 x (\cos^2 x - 1)$$

$$\frac{1}{\cos^2 x} (-\sin^2 x) = -\tan^2 x$$

$$\sin^2 x + \cos^2 x = 1$$

$$\sin^2 x + \cos^2 x - 1 = 0$$

$$\cos^2 x - 1 = -\sin^2 x$$

$$8. (1 - \cos^2 x)(1 + \tan^2 x)(1 - \operatorname{cosec}^2 x)$$

$$(1 - \cos^2 x)(1 + \tan^2 x)(1 - \operatorname{cosec}^2 x) = \sin^2 x \sec^2 x (-\cot^2 x)$$

$$\sin^2 x \sec^2 x (-\cot^2 x) = \sin^2 x \frac{1}{\cos^2 x} \left(-\frac{\cos^2 x}{\sin^2 x}\right) = -1$$

$$1 + \cot^2 x = \operatorname{cosec}^2 x$$

$$\cot^2 x = \operatorname{cosec}^2 x - 1$$

$$-\cot^2 x = 1 - \operatorname{cosec}^2 x$$