

Verify this trig identity.

$$\frac{1-\cos x}{1-\cos x} \cdot \frac{1+\cos x}{\sin x} = \frac{\sin x}{1-\cos x} \cdot \frac{\sin x}{\sin x}$$

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

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

Verify this identity:

$$\tan x + \cot x = (\sec x)(\csc x)$$

$$\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = \frac{\cos x}{\cos x} \cdot \frac{1}{\sin x}$$

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

Verify this identity:

$$\sin^2 x \cdot \tan^2 x = \tan^2 x - \sin^2 x$$

$$\sin^2 x \cdot \frac{\sin^2 x}{\cos^2 x} = \frac{\sin^2 x}{\cos^2 x} - \sin^2 x \cdot \frac{\cos^2 x}{\cos^2 x}$$

$$\frac{\sin^4 x}{\cos^2 x} = \frac{\sin^2 x - \sin^2 x \cos^2 x}{\cos^2 x}$$

$$= \frac{\sin^2 x(1 - \cos^2 x)}{\cos^2 x} \quad \text{factor out } \sin^2 x$$

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

$$\frac{\sin^4 x}{\cos^2 x} = \frac{\sin^4 x}{\cos^2 x}$$

Verify this trig identity.

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

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

$$\frac{1 - 2 \sin x \cos x}{\cos x}$$

$$\frac{1}{\cos x} - \frac{2 \sin x \cos x}{\cos x}$$

$$\sec x - 2 \sin x = \sec x - 2 \sin x$$

You should now be able to complete

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Problems: 1, 8, 46, 48, 49, 55, 56