

Trigonometry Worksheet: Verify Identities (4)

Verify the identities

$$1. \quad \sqrt{\frac{1 + \sin x}{1 - \sin x}} = \frac{1 + \sin x}{|\cos x|}$$

start with left side and multiply numerator and denominator by $1 + \sin x$

$$\sqrt{\frac{1 + \sin x}{1 - \sin x}} = \sqrt{\frac{(1 + \sin x)(1 + \sin x)}{(1 - \sin x)(1 + \sin x)}}$$

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

$$= \sqrt{\frac{(1 + \sin x)^2}{\cos^2 x}} = \frac{|1 + \sin x|}{|\cos x|}$$

since $1 + \sin x \geq 0 \Rightarrow |1 + \sin x| = 1 + \sin x$

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