Outcome 2 – Trig identities

Silver example

Examples...

Show that $sinxtanx = \frac{sin^2 x}{cosx}$

LHS = $sinxtanx$ **Replace $tanx$ with $\frac{sinx}{cosx}$ **

$= sinx \times \frac{sinx}{cosx}$

$= \frac{sinxsinx}{cosx}$

$= \frac{sin^2 x}{cosx}$

$=$ RHS

Since LHS = RHS

$sinxtanx = \frac{sin^2 x}{cosx}$

Gold example

Examples...

Show that $sinx\,cos^2 x + sin^3 x = sinx$

** Replace $cos^2 x$ with $(1 - sin^2 x)$ **

LHS = $sinx\,cos^2 x + sin^3 x$

$= sinx\,(1 - sin^2 x) + sin^3 x$

$= sinx - sin^3 x + sin^3 x$

$= sinx =$ RHS

Since LHS = RHS

$sinx\,cos^2 x + sin^3 x = sinx$

Silver Questions

Prove the following trig identities...

1. Show that $tanxcosx = sinx$
2. Show that $\cos^3 x\,tanx = sinx\,cos^2 x$
3. Show that $tanx + \frac{1}{cosx} = \frac{sinx + 1}{cosx}$
4. Show that $\frac{sinx}{tanx} = cosx$

$$tanx = \frac{sinx}{cosx}$$

Gold Questions

Prove the following trig identities...

1. Show that $cos^2 x + 7 = 8 - sin^2 x$
2. Show that $9 - sin^2 x = 8 + cos^2 x$
3. Show that $cosx\,sin^2 x = cosx - cos^3 x$
4. Show that $\frac{cos^2 x}{sinx} - \frac{1}{sinx} = -sinx$

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

and can be re-written as...

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

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

Silver Answers

$$\frac{sinx}{cosx} \times cosx = \frac{sinxcosx}{cosx} = sinx$$

$$cos^3x \times \frac{sinx}{cosx} = \frac{cos^3xsinx}{cosx} = sinxcos^2x$$

$$\frac{sinx}{cosx} + \frac{1}{cosx} = \frac{sinx + 1}{cosx}$$

$$\frac{sinx}{\frac{sinx}{cosx}} = \frac{sinxcosx}{sinx} = cosx$$

Gold Answers

$$= 1 - sin^2x + 7 = 8 - sin^2x$$

$$= 9 - (1 - cos^2x) = 9 - 1 + cos^2x = 8 + cos^2x$$

$$= cosx(1 - cos^2x) = cosx - cos^3x$$

$$= \frac{1 - sin^2x}{sinx} - \frac{1}{sinx} = \frac{-sin^2x}{sinx} = -sinx$$

