C12 - 6.1 - Ratios $cscx\ secx\ cotx$ HW

Simplify

$sinxsecx$ $cosxcosx$ $tanxcotx$ $cscxcscx$

$sinxsinx$ $cosxsecx$ $tanxcscx$ $secxsecx$

$sinxcosx$ $cosxcscx$ $tanxtanx$ $cotxssecx$

$sinxcotx$ $cosxtanx$ $cotxcotx$

$sinxcscx$ $cosxsinx$ $tanxsinxcotx$

Simplify to $sinx$ and $cosx$

$sinxtanx$ $cosxcotx$ $tanxsecx$ $cscxcotx$ $cscxsecx$

C12 - 6.1 - Ratios $cscx\ secx\ cotx$ Notes

Simplify

$\sin^2 xcscx$

$\csc^2 x\ sinx$

$cscxcos^2 x$

$\sec^2 xcosx$

$\sin^2 xcsc^2 x$

$\sin^2 xcot^2 x$

$\cos^2 xsec^2 x$

$\cos^2 xtan^2 x$

$\csc^2 xsec^2 x$

$\tan^2 xcot^2 x$

$\csc^2 xcot^2 x$

$\sec^2 xtan^2 x$

C12 - 6.1 - Ratios $cscx\ secx\ cotx$ HW

Simplify

$\frac{sinx}{sinx}$ $\frac{sinx}{cosx}$ $\frac{1}{sinx}$ $\frac{cscx}{cscx}$ $\frac{1}{tanx}$

$\frac{cotx}{cotx}$ $\frac{1}{cosx}$ $\frac{1}{cotx}$ $\frac{sinx}{cotx}$ $\frac{secx}{secx}$

$\frac{cosx}{cosx}$ $\frac{1}{cscx}$ $\frac{tanx}{tanx}$ $\frac{cosx}{sinx}$ $\frac{1}{secx}$

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

$\frac{tanx}{sinx}$ $\frac{tanx}{cosx}$ $\frac{secx}{cosx}$ $\frac{cscx}{cosx}$ $\frac{cotx}{cosx}$

Try it in your head!

$\frac{cosx}{secx}$ $\frac{cosx}{cscx}$ $\frac{tanx}{cscx}$ $\frac{secx}{tanx}$ $\frac{cotx}{secx}$

$\frac{cscx}{tanx}$ $\frac{secx}{cotx}$ $\frac{cscx}{secx}$ $\frac{cscx}{cotx}$

C12 - 6.1 - Ratios $cscx\ secx\ cotx$ HW

Simplify

$\frac{sinxcotx}{\sec x}$

$\frac{cosxtanx}{secx}$

$\frac{cscxtanx}{cscx}$

$\frac{cotxsec^2x}{\csc^2 x}$

$\frac{tanxcsc^2x}{\sec^2 x}$

$\frac{cosxsec^2x}{\sec^2 x}$

$\frac{sinxcsc^2x}{\csc^2 x}$

C12 - 6.2 - Add Subtract Fractions WS

Simplify

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

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

$cotx+cscx$

$secx+tanx$

$sinx+cscx$

$sinx+secx$

$cosx+secx$

$cosx+cscx$

$sinx-secx$

$cosx-cotx$

$cosx+sinxtanx$

$sinx+cosxcotx$

C12 - 6.2 - Add Subtract Fractions Pythag WS

Simplify

$cscx - cotxcosx$ $secx - tanxsinx$ $cscx\,cos^2 x + sinx$ $secx\,sin^2 x + cosx$

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

$\frac{cosx + cotx}{1 + sinx}$ $\csc^2 x - \frac{cotx}{sinx}$

C12 - 6.2 - Add Subtract Fractions Pythag WS

Simplify

$$\frac{1}{1-sinx}+\frac{1}{1+sinx}$$

$$\frac{cosx}{1+cosx}+\frac{cosx}{1-cosx}$$

$$\frac{1}{1-sinx}-\frac{1}{1+sinx}$$

$$\frac{cosx}{1+cosx}-\frac{cosx}{1-cosx}$$

$$\frac{1}{1+cosx}-\frac{1}{1-cosx}$$

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

C12 - 6.2 - Add Subtract Fractions Complex WS

Simplify

$\dfrac{1+\dfrac{1}{sinx}}{cotx}$

$\dfrac{1+\dfrac{1}{cosx}}{tanx}$

$\dfrac{secx}{1+\dfrac{1}{cosx}}$

$\dfrac{tanx}{1+\dfrac{1}{cosx}}$

$\dfrac{secx}{1+\dfrac{sinx}{cosx}}$

$\dfrac{1+sinx}{1+cscx}$

$\dfrac{1+cscx}{1+secx}$

$\dfrac{1+tanx}{1+cotx}$

$\dfrac{cscx+secx}{cotx+1}$

$\dfrac{cscx+secx}{tanx+1}$

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

$sinxsecx$	$tanx$

$cosxtanx$	$sinx$

$sinxcscx$	1

$cosxcscx$	$cotx$

$cosxsecx$	1

$tanxcscx$	$secx$

$cotxsecx$	$cscx$

$sinxcotx$	$cosx$

$cosxcotx$	$\frac{\cos^2 x}{\sin x}$

$cotxcotx$	$\cot^2 x$

$cosxsinx$	$sinxcosx$

$\sin^2 x$	$sinxsinx$

$tanxsecx$	$\frac{sinx}{\cos^2 x}$

$tanxcotx$	1

Make one up!	

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

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

$\frac{cosx}{secx}$	$\cos^2 x$

$\frac{1}{cosx}$	$secx$

$\frac{tanx}{sinx}$	$secx$

$\frac{tanx}{cosx}$	$\frac{sinx}{\cos^2 x}$

$\frac{sinx}{sinx}$	1

$\frac{sinx}{cotx}$	$\frac{\sin^2 x}{\cos x}$

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

$\frac{cosx}{cotx}$	$sinx$

$\frac{secx}{tanx}$	$cscx$

$\frac{tanx}{cscx}$	$secx$

$\frac{cscx}{cotx}$	$cosx$

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

$cotx + cscx$	$\frac{cosx + 1}{sinx}$

$\frac{1 + sinx}{cosx}$	$secx + tanx$

$sinx + cscx$	$\frac{\sin^2 x + 1}{sinx}$

$sinx + secx$	$\frac{sinxcosx + 1}{cosx}$

$2sinx - \frac{1}{cscx}$	$sinx$

$secx - tanxsinx$	$cosx$

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

$cosx + sinxtanx$	$secx$

$cscx\,cos^2 x + sinx$	$cscx$

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

$\csc^2 x - \frac{cotx}{sinx}$	$\frac{1}{1 + cosx}$

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

$\cot^2 x$	$\frac{\cos^2 x}{1 - \cos^2 x}$

C12 - 6.3 - Proofs Pythag Reciprocal Fractions HW

Prove the left hand side equals the right hand side

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

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

$1+\frac{1}{\tan^2 x}$	$\csc^2 x$

$2-\frac{1}{\csc^2 x}$	$1+\cos^2 x$

$cscx\ cos^2 x + sinx$	$cscx$

$secx\ sin^2 x + cosx$	$secx$

C12 - 6.3 - Proofs Add Subtract Foil Factor Pythag WS

Prove the left hand side equals the right hand side

$\frac{(cscx + cotx)(cscx - cotx)}{\sin^2 x}$ | $\csc^2 x$

$\frac{cosx}{1 + sinx} + \frac{1 + sinx}{cosx}$ | $2secx$

$\frac{1}{1 - cosx} + \frac{1}{1 + cosx}$ | $2\csc^2 x$

$\frac{cosx}{1 - cosx} - \frac{cosx}{1 + cosx}$ | $2\cot^2 x$

$\frac{1}{1 - cosx} - \frac{1}{1 + cosx}$ | $2cotxcscx$

$(sinx - cosx)^2$ | $1 - 2sinxcosx$

C12 - 6.3 - Proofs Add Subtract Foil Factor Pythag WS

Prove the left hand side equals the right hand side

$cosx - cotx$	$cotx(sinx - 1)$

$secx\ sin^2 x + cosx$	$secx$

$3 - sin^2 x$	$2 + \cos^2 x$

$sinx - cscx$	$\frac{-\cos^2 x}{sinx}$

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

$\frac{1 + sinx}{1 + cscx}$	$\frac{sinx}{1 - sinx}$

C12 - 6.3 - Proofs Add Subtract Comp Frac Pythag WS

Prove the left hand side equals the right hand side

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

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

$\frac{cscx}{1+\frac{1}{sinx}}$	$\frac{1}{1+sinx}$

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

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

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

C12 - 6.3 - Proofs Add Subtract Comp Frac Pythag WS

Prove the left hand side equals the right hand side

$\frac{1+sinx}{1+cscx}$ | $sinx$

$cosx$ | $\frac{1+cosx}{1+secx}$

$\frac{1+secx}{1+cscx}+1$ | 2

$\frac{1+cotx}{1+tanx}$ | $cotx$

$\frac{cscx+secx}{cotx+1}$ | $secx$

$cscx$ | $\frac{cscx+secx}{tanx+1}$

C12 - 6.4 - Proofs Conjugate HW

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

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

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

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

$secx + tanx$	$\frac{cosx}{1-sinx}$

C12 - 6.4 - FOIL Factor WS (See 4.5 Notes)

Distribute/Foil

$sinx(1 - sinx)$

$cosx(sinx + 1)$

$(1 + cosx)(1 - cosx)$

$(sinx - cosx)^2$

$(sinx + 2)(sinx - 1)$

$(cosx + 1)(cosx - 3)$

Factor

$\sin x - \sin^2 x$

$sinxcosx + cosx$

$cosx + \cos^2 x$

$1 - \sin^2 x$

$1 + \sin^2 x$

$\sin^3 x - sinx$

$cos^2 x + cosx - 2$

$cos^3 x + \cos^2 x - 2cosx$

$cos^4 x - \cos^2 x - 2$

$2\sin^2 x + sinx - 1$

$cscx^2 - 2cscx - 3$

$2sinx - \frac{1}{sinx} + 1$

C12 - 6.4 - Proofs FOIL Factor Pythag WS (See 4.5 Notes)

Prove the left hand side equals the right hand side

$(sinx - 2)(sinx + 1)$ | $\sin^2 x - sinx - 2$

$(1 + sinx)(1 - sinx)$ | $\cos^2 x$

$(1 + cosx)(1 - cosx)$ | $\sin^2 x$

$(2cosx - 1)(cosx + 2)$ | $2\cos^2 x + 3cosx - 2$

Make up two!

C12 - 6.5 - Expand Sum Difference WS

Expand:

$\sin(x+\frac{\pi}{3})$

$\sin(x-\pi)$

$\cos(x+\frac{\pi}{6})$

$\cos(x+\frac{\pi}{4})$

Find the exact value of the following:

$cos15^o =$

$sin75^o =$

$\cos\left(\frac{\pi}{12}\right)=$

$sin{-}15^o=$

$csc15^0$

$\cos\left(\frac{7\pi}{12}\right) =$

C12 - 6.5 - Simplify Sum Difference WS

Simplify to a single trigonometric identity:

$cos2x\ cosx + sin2x\ sinx$

$sin3x\ cosx - cos3x\ sinx$

$sinA\ cos2A + cosA\ sin2A$

$cosB\ cos3B - sinB\ sin3B$

Find the exact value of:

$\cos\left(\frac{\pi}{3}\right)\cos\left(\frac{\pi}{6}\right) + \sin\left(\frac{\pi}{3}\right)\sin\left(\frac{\pi}{6}\right)$

$\sin\left(\frac{11\pi}{12}\right)\cos\left(\frac{\pi}{12}\right) - \cos\left(\frac{11\pi}{12}\right)\sin\left(\frac{\pi}{12}\right)$

C12 - 6.6 - Double Angle HW

Simplify the following.

$4 \sin 3x \cos 3x =$

$6 \sin \frac{x}{2} \cos \frac{x}{2} =$

$8 \sin(\frac{\pi}{4}) \cos \frac{\pi}{4} =$

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

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

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

$2 \cos^2 \frac{x}{4} - 1 =$

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

$3 - 6 \sin^2 3x =$

$2 \cos^2 \frac{\pi}{2} - 1 =$

$\sec 10x \, (\sin^2 5x - \cos^2 5x) =$

$2 \sin 4x \, (\cos^2 2x - \sin^2 2x \,) =$

C12 - 6.6 - Double Angle HW

Simplify the following.

$1 + cos2x =$

$1 - cos2x =$

$cos2x + 1 =$

$cos2x - 1 =$

$\frac{1 + cos2x}{\sin^2 x} =$

$\frac{1 - cos2x}{\tan^2 x} =$

$\frac{cos2x - 1}{\sin^2 x} =$

$\frac{cos2x - 1}{2\csc^2 x} =$

C12 - 6.6 - Solve Double Angle WS (See 4.5 Notes)

$sinxcosx = 0$

$sin2x = 0$

$sin2x = 1$

$cos2x = 0$

$cos2x = -1$

$cos2x = 1$

$sin4x = 0$

$cos3x = -1$

$\cos\left(\frac{x}{2}\right) = 1$

$\sin\left(\frac{1}{3}x\right) = -1$

C12 - 6.6 - Solve Double Angle WS (See 4.5 Notes)

$sin2x + cosx = 0$

$sinx + cos2x = 1$

$sinx - cos2x = -1$

$sin2x = -sinx$

$\sin^2 x + cos2x = 0$

$\cos^2 x - cos2x = 0$

$\cos^2 x - cos2x = 1$

$sinx - cos2x = 0$

$cosx + cos2x = 0$

$cosx - cos2x = 0$

$3sinx + cos2x = -1$

$3cosx + cos2x = 1$

C12 - 6.6 - Solve Double Angle WS (See 4.5 Notes)

$sin2x = \frac{1}{2}$

$cos2x = -\frac{1}{\sqrt{2}}$

$\cos\left(\frac{x}{2}\right) = \frac{1}{2}$

$cos3x = \frac{\sqrt{3}}{2}$

$tan2x = \sqrt{3}$

$sin4x = \frac{1}{\sqrt{2}}$

$\sin(\frac{1}{3}x) = \frac{\sqrt{3}}{2}$

C12 - 6.6 - Solve Double Angle WS (See 4.5 Notes)

$2cotxsin^2x = 1$

$2tanxscos^2x = \frac{1}{2}$

$2sinxcosx + 1 = 0$

$4\cos^2 2x - \sqrt{3} = 0$

$cos2x = 2\sin^2 x$

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