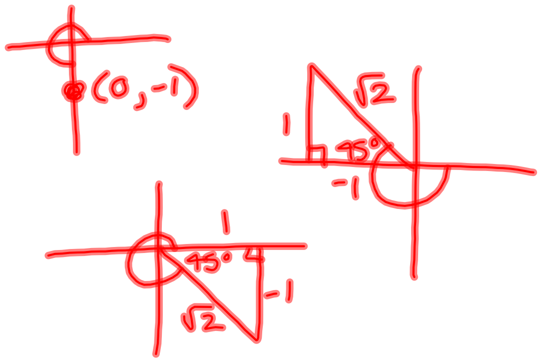
Review:

Evaluate: $\sin 270° = \boxed{-1}$

$\cos(-225°) = \boxed{\frac{-1}{\sqrt{2}}}$

$\sec 315° = \boxed{\sqrt{2}}$

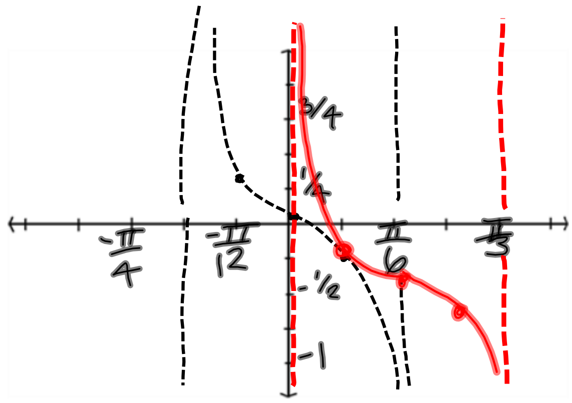


Graph: $y = -\frac{1}{4}\tan\left(3x - \frac{\pi}{2}\right) - \frac{1}{2}$

$= -\frac{1}{4}\tan 3\left(x - \frac{\pi}{6}\right) - \frac{1}{2}$

amp: $\frac{1}{4}$ right $\frac{\pi}{6}$

per: $\frac{\pi}{3}$ down $\frac{1}{2}$



6.3 Evaluate using the half-angle identity.

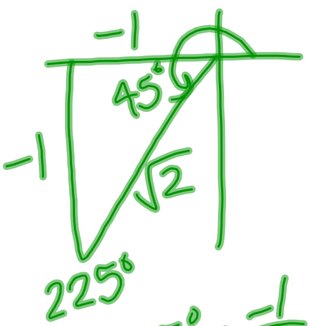
14. sin 112.5°

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

$= \sin\frac{(112.5°)\times 2}{2}$

+ bc 112.5° ∈ Q2

$= \sin\frac{225°}{2} = +\sqrt{\frac{1-\cos 225°}{2}}$



$\cos 225° = \frac{-1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$

$= \sqrt{\frac{1-\left(-\frac{\sqrt{2}}{2}\right)}{2}} = \sqrt{\frac{\frac{2}{2}+\frac{\sqrt{2}}{2}}{2}}$

$= \sqrt{\frac{2+\sqrt{2}}{2}\cdot\frac{1}{2}} = \sqrt{\frac{2+\sqrt{2}}{4}} = \frac{\sqrt{2+\sqrt{2}}}{\sqrt{4}} = \boxed{\frac{\sqrt{2+\sqrt{2}}}{2}}$

<u>6.3 Handout</u> Prove the identity.

50. $\cos 8x = \cos^2 4x - \sin^2 4x$

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

$= RHS \, \square$

52. $\dfrac{\cos 2x}{\sin^2 x} = \cot^2 x - 1$

$LHS = \dfrac{\cos^2 x - \sin^2 x}{\sin^2 x} = \dfrac{\cos^2 x}{\sin^2 x} - \dfrac{\sin^2 x}{\sin^2 x} = \cot^2 x - 1$

$= RHS \, \square$

54. $\dfrac{1}{1 - \cos 2x} = \dfrac{1}{2}\csc^2 x$

$LHS = \dfrac{1}{1 - (1 - 2\sin^2 x)} = \dfrac{1}{2\sin^2 x} = \dfrac{1}{2} \cdot \dfrac{1}{\sin^2 x} = \dfrac{1}{2}\csc^2 x$

$= RHS \, \square$

56. $\dfrac{\cos^2 x - \sin^2 x}{2\sin x \cos x} = \cot 2x$

$RHS = \dfrac{\cos 2x}{\sin 2x} = \dfrac{\cos^2 x - \sin^2 x}{2\sin x \cos x} = LHS \, \square$

60. $\sin 2x - \cot x = -\cot x \cos 2x$

$RHS = -\cot x(1-2\sin^2 x)$

$= -\cot x + 2\sin^2 x \cot x$

$= -\cot x + \frac{2\sin^{\cancel{2}} x}{1} \cdot \frac{\cos x}{\cancel{\sin x}}$

$= -\cot x + 2\sin x \cos x$

$= -\cot x + \sin 2x$

$= LHS$ ▫

62. $\sin 4x = 4\sin x \cos^3 x - 4\cos x \sin^3 x$

$LHS = \sin 2(2x) = 2\sin 2x \cos 2x$

$= \underbrace{2(2\sin x \cos x)}_{4\sin x \cos x}(\cos^2 x - \sin^2 x)$

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

$= RHS$ ▫

64. $2\cos^4 x - \cos^2 x - 2\sin^2 x\cos^2 x + \sin^2 x = \cos^2 2x$

$RHS = (\cos 2x)^2 = (\cos 2x)(\cos 2x)$

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

$= 2\cos^4 x - \cos^2 x - 2\sin^2 x\cos^2 x + \sin x$

$= LHS$ ▫

66. $\sin 4x = 4\sin x\cos x - 8\cos x\sin^3 x$

68. $\sin 3x + \sin x = 4\sin x - 4\sin^3 x$

6.3 handout:

49-93 odd