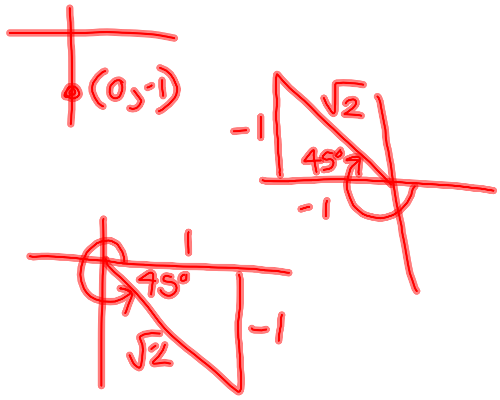
Review:

Evaluate: $\sin 270° = \boxed{-1}$

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

$\sec 315° = \boxed{\sqrt{2}}$

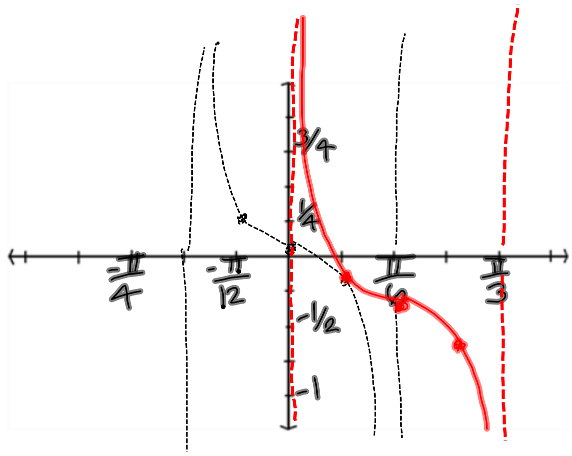


Graph: $y = -\frac{1}{4}\tan\left(3x - \frac{\pi}{2}\right) - \frac{1}{2}$

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

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

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



6.3 Evaluate using the half-angle identity.

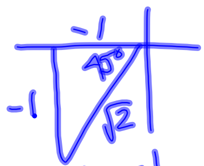
14. sin 112.5°

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

$= \sin\frac{(112.5°)\times 2}{2}$

+ bc 112.5° ∈ Q II

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



$\cos 225° = -\frac{1}{\sqrt{2}}$

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

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

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

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

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

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

$\dfrac{a}{b\cdot c} = \dfrac{a}{1}\cdot\dfrac{1}{b\cdot c} = \dfrac{1}{b}\cdot\dfrac{a}{c}$ $\quad \dfrac{1}{2}\cdot\dfrac{1}{\sin^2 x}$

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

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

$LHS = \dfrac{\cos 2x}{\sin 2x} = \cot 2x = RHS$ $\square$

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

$$\text{LHS} = 2\sin x\cos x - \cot x$$

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

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

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

$$= -\cot x\cos 2x = \text{RHS}_{\square}$$

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

$$\text{LHS} = \sin 2(2x) = 2\underline{\sin 2x}\,\underline{\cos 2x}$$

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

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

$$= \text{RHS}_{\square}$$

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

$\text{RHS} = (\cos 2x)^2 = (\underline{\cos 2x})(\underline{\cos 2x})$

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

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

$= \text{LHS}$ ▫

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