HW: Trig I-2: 21, 23, 26, 28

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In Problems 19–98, establish each identity.

37. $\sec u - \tan u = \dfrac{\cos u}{1 + \sin u}$

38. $\csc u - \cot u = \dfrac{\sin u}{1 + \cos u}$

39. $3 \sin^2 \theta + 4 \cos^2 \theta = 3 + \cos^2 \theta$

40. $9 \sec^2 \theta - 5 \tan^2 \theta = 5 + 4 \sec^2 \theta$

41. $1 - \dfrac{\cos^2 \theta}{1 + \sin \theta} = \sin \theta$

42. $1 - \dfrac{\sin^2 \theta}{1 - \cos \theta} = -\cos \theta$

43. $\dfrac{1 + \tan v}{1 - \tan v} = \dfrac{\cot v + 1}{\cot v - 1}$

44. $\dfrac{\csc v - 1}{\csc v + 1} = \dfrac{1 - \sin v}{1 + \sin v}$

45. $\dfrac{\sec \theta}{\csc \theta} + \dfrac{\sin \theta}{\cos \theta} = 2 \tan \theta$

46. $\dfrac{\csc \theta - 1}{\cot \theta} = \dfrac{\cot \theta}{\csc \theta + 1}$

47. $\dfrac{1 + \sin \theta}{1 - \sin \theta} = \dfrac{\csc \theta + 1}{\csc \theta - 1}$

48. $\dfrac{\cos \theta + 1}{\cos \theta - 1} = \dfrac{1 + \sec \theta}{1 - \sec \theta}$

49. $\dfrac{1 - \sin v}{\cos v} + \dfrac{\cos v}{1 - \sin v} = 2 \sec v$

50. $\dfrac{\cos v}{1 + \sin v} + \dfrac{1 + \sin v}{\cos v} = 2 \sec v$

51. $\dfrac{\sin \theta}{\sin \theta - \cos \theta} = \dfrac{1}{1 - \cot \theta}$

52. $1 - \dfrac{\sin^2 \theta}{1 + \cos \theta} = \cos \theta$

53. $\dfrac{1 - \sin \theta}{1 + \sin \theta} = (\sec \theta - \tan \theta)^2$

54. $\dfrac{1 - \cos \theta}{1 + \cos \theta} = (\csc \theta - \cot \theta)^2$