21)

$$\sin^{1/2} x \cos x - \sin^{5/2} x \cos x$$

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

$$\cos^3 x \sqrt{\sin x} \quad \cos^2 x$$

$$y \cos x - y^5 \cos x$$

$$y \cos x (1 - y^4)(1 - \sin^2 x)$$

22)

$$\sec^6 x(\sec x \tan x) - \sec^4 x(\sec x \tan x)$$

$$\sec^7 x \tan x - \sec^5 x \tan x$$

$$\sec^5 x \tan x (\sec^2 x - 1)$$

$$\sec^5 x \tan x (\tan^2 x)$$

$$\sec^5 x \tan^3 x$$

27) $\dfrac{\cos(-x)}{1+\sin(-x)}$

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

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

$$\frac{1+\sin x}{\cos x} = \frac{1}{\cos x} + \frac{\sin x}{\cos x}$$

$$\sec x + \tan x$$

29\

$$=\frac{\tan x+\tan y}{1-\tan x\tan y}$$

$$\frac{\frac{\sin x\cos y}{\cos x\cos y}+\frac{\cos x\sin y}{\cos x\cos y}}{\frac{\cos x\cos y}{\cos x\cos y}-\frac{\sin x\sin y}{\cos x\cos y}}=\frac{\tan x+\tan y}{1-\tan x\tan y}$$

Do page 354

30, 33, 37, 39

37)

$$\sin x \csc\left(\frac{\pi}{2} - x\right)$$

$$\sin x \sec x$$

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

$$\tan x$$

33) $\sqrt{\frac{1+\sin x}{1-\sin x}\,(1+\sin x)}$

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

$$\cos^2 x$$

30) $$\frac{\frac{\tan x}{\tan x \tan y} + \frac{\tan y}{\tan x \tan y}}{\frac{1 - \tan x \tan y}{\tan x \tan y}} = \frac{\frac{1}{\tan y} + \frac{1}{\tan x}}{\frac{1}{\tan x \tan y} - 1}$$

$$= \frac{\cot y + \cot x}{\cot x \cot y - 1}$$

39)

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

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

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

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

$$2 - 1 = 1$$

$$1 = 1$$

31) $\dfrac{\cos x - \cos y}{\sin x + \sin y} + \dfrac{\sin x - \sin y}{\cos x + \cos y}$