p387 #1, 5, 10, 13, 23, 27, 29

(1) $\sin t \csc t = 1$

$\sin t \cdot \frac{1}{\sin t} = 1$ ✓

(5) $\cos^2\beta - \sin^2\beta = 1 - 2\sin^2\beta$

$(1 - \sin^2\beta) - \sin^2\beta = 1 - 2\sin^2\beta$ ✓

(10) $\frac{\cot^3 t}{\csc t} = \cos t(\csc^2 t - 1)$

$= \sin t \cot t \cot^2 t$

$= \sin t \frac{\cos t}{\sin t}(\csc^2 - 1)$

$= \cos t(\csc^2 t - 1)$ ✓

(13) $\sin^{1/2} x \cos x - \sin^{5/2} x \cos x = \cos^3 x \sqrt{\sin x}$

$= \cos x \sin^{1/2} x (1 - \sin^2 x) = \cos^3 x \sqrt{\sin x}$ ✓

(23) $\frac{1}{\sin x + 1} + \frac{1}{\csc x + 1} = 1$

$\frac{(\csc x + 1) + (\sin x + 1)}{(\sin x + 1)(\csc x + 1)} = \frac{(\csc x + 1) + (\sin x + 1)}{\sin x \csc x + \csc x + \sin x + 1}$

$= \frac{\csc x + \sin x + 2}{\csc x + \sin x + 2}$ ✓ $= 1$ ✓

(27) $\frac{\csc(-x)}{\sec(-x)} = -\cot x$

$\frac{\cos(-x)}{\sin(-x)} = \frac{\cos x}{-\sin x} = -\cot x$ ✓

(29) $\frac{\tan x \cot x}{\cos x} = \sec x$

$= \frac{\tan x \frac{1}{\tan x}}{\cos x} = \frac{1}{\cos x} = \sec x$ ✓