ex 8.3

(4) LHS $= (\sin\alpha + \cos\alpha)(\tan\alpha + \cot\alpha)$

$$= (\sin\alpha + \cos\alpha)\left[\frac{\sin\alpha}{\cos\alpha} + \frac{\cos\alpha}{\sin\alpha}\right]$$

$$= (\sin\alpha + \cos\alpha)\left[\frac{\sin^2\alpha + \cos^2\alpha}{\sin\alpha\cos\alpha}\right]$$

$$= (\sin\alpha + \cos\alpha)\frac{(1)}{\sin\alpha\cos\alpha}$$

$$= \frac{\cancel{\sin}\alpha}{\cancel{\sin}\alpha\cos\alpha} + \frac{\cancel{\cos}\alpha}{\sin\alpha\cancel{\cos}\alpha}$$

$$= \sec\alpha + \operatorname{cosec}\alpha$$

$= RHS$

(5) $LHS = (\sqrt{3}+1)(3 - \cot 30^\circ)$

$$= (\sqrt{3}+1)(3-\sqrt{3})$$
$$= \sqrt{3}(\sqrt{3}+1)(\sqrt{3}-1)$$
$$= \sqrt{3}\left[(\sqrt{3})^2 - 1^2\right]$$
$$= \sqrt{3}(3-1)$$
$$= 2\sqrt{3}$$

$RHS = \tan^3 60^\circ - 2\sin 60^\circ$

$$= (\sqrt{3})^3 - \cancel{2} \times \frac{\sqrt{3}}{\cancel{2}}$$
$$= 3\sqrt{3} - \sqrt{3}$$
$$= 2\sqrt{3}$$

$\therefore LHS = RHS$