

22. Cont.

$$= -\frac{\sqrt{15}\sqrt{6}}{30} + \frac{\sqrt{2}\sqrt{6}}{15}$$

$$- \frac{\sqrt{2}\sqrt{15}}{30} - \frac{1}{60}$$

$$\equiv -\frac{3\sqrt{10}}{30} + \frac{2\sqrt{3}}{15}$$

$$- \frac{\sqrt{30}}{30} - \frac{1}{60}$$

$$\equiv \frac{-6\sqrt{10} + 8\sqrt{3} - 2\sqrt{30} - 1}{60}$$

b) $\cos(x+y) = \cos x \cos y - \sin x \sin y$
 $= \cos x \frac{\cos x}{3} - \sin x \sin x$

$$\equiv \frac{1}{3} \cos^2 x - 2 \sin^2 x$$

$$\equiv \frac{\cos^2 x - 6 \sin^2 x}{3}$$

$$\equiv \frac{\cos^2 x - 6(1 - \cos^2 x)}{3}$$

$$\equiv \frac{\cos^2 x - 6 + 6\cos^2 x}{3}$$

$$\cos(x+y) = \frac{7\cos^2 x - 6}{3}$$

23. $\begin{cases} \frac{\sin x}{\sin y} = \frac{1}{2} \\ \frac{\cos x}{\cos y} = 3 \end{cases}$

a) $\sin(x+y) = \sin x \cos y + \sin y \cos x$

$$\equiv \sin x \frac{\cos x}{3} + 2 \sin y \cos x$$

$$\equiv \frac{1}{3} \sin x \cos x + 2 \sin y \cos x$$

$$= \frac{7}{3} \sin x \cos x$$

24.

$$2 \sin(x-y) = \sin(x+y)$$

$$2 \sin x \cos y - 2 \sin y \cos x =$$

$$= 2 \sin x \cos y + \sin y \cos x$$

$$2 \sin x \cos y - \sin x \cos y =$$

$$= \sin y \cos x + \sin y \cos x$$

$$\sin x \cos y = 2 \sin y \cos x$$

$$\frac{\sin x}{\cos x} = 3 \frac{\sin y}{\cos y}$$

$$\boxed{\tan x = 3 \tan y}$$