

VIII. SUM TO PRODUCT

9 pts

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

$$\sin(x-y) = \sin x \cos y - \cos x \sin y$$

$$\text{Add: } 31) \quad \boxed{\sin(x+y) + \sin(x-y) = 2 \sin x \cos y}$$

$$\text{Subtract: } 32) \quad \boxed{\sin(x+y) - \sin(x-y) = 2 \cos x \sin y}$$

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

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

$$\text{Add: } 33) \quad \boxed{\cos(x+y) + \cos(x-y) = 2 \cos x \cos y}$$

$$\text{Subtract: } 34) \quad \boxed{\cos(x+y) - \cos(x-y) = -2 \sin x \sin y}$$

Note: If $x > y$, then

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

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

+3 pts