Name: _____

Product – to – Sum Formulas

Exercise 1: Use the product – to – sum formulas to write the product as a sum or difference

1) $6\sin\frac{\pi}{4}\cos\frac{\pi}{4}$

2) $10\sin 75^0\cos 15^0$

3) $\cos 2x\cos 4x$

4) $4\sin\frac{\pi}{3}\cos\frac{5\pi}{6}$

5) $6\sin 45^0\cos 15^0$

6) $\cos 3x\cos 7x$

7) $\cos 4x\sin 5x$

8) $\sin 5x\sin 2x$

9) $3\sin 2x\sin 3x$

10) $\cos 5x\sin 3x$

11) $3\sin 2\alpha\sin 3\alpha$

12) $5\cos(-5\beta)\cos 3\beta$

13) $\cos 2\theta\cos 4\theta$

14) $\sin(x+y)\sin(x-y)$

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

16) $\cos(\theta-\pi)\sin(\theta+\pi)$

17) $\sin(\theta+\pi)\sin(\theta-\pi)$

Exercise 2: Use product-to-sum identities to find the exact value each expression without using calculators.

1) $\cos 15^\circ\cos 75^\circ$
2) $\sin 195^\circ\cos 75^\circ$
3) $\sin 165^\circ\sin 105^\circ$