# Risp 26: Teacher Notes

Suggested Use: to introduce Compound Angle Formulae

Once again I return here to the Explore-by-Mixing-Things-Up method. When it comes to compound angles, this technique almost suggests itself, as we can see its results before our eyes. Suppose we pick n = 4, and m = 3. We get nine possible functions for y altogether: what happens if we plot these?

1. sin 3x cos 4x + sin 4x cos 3x - gives sin 7x
2. sin 3x cos 3x + sin 4x cos 4x - weird!
3. sin 3x sin 4x + cos 3x cos 4x - gives cos x
4. sin 3x cos 4x - sin 4x cos 3x - gives -sin x
5. sin 3x cos 3x - sin 4x cos 4x - weird!
6. sin 3x sin 4x - cos 3x cos 4x - gives -cos 7x
7. sin 4x cos 3x - sin 3x cos 4x - gives sin x
8. sin 4x cos 4x - sin 3x cos 3x - weird!
9. cos 3x cos 4x - sin 3x sin 4x - gives cos 7x

This provides excellent practice in identifying transformations applied to standard trig curves. Once students have come up with possible identities, they can be challenged to prove them. Given that they now know what they heading towards, they will have a much better chance of doing this, although I acknowledge this could be tough, and support will be required. But trying first means that when the teacher comes to prove some or all of these, attention is guaranteed(!)