

## Solutions to Quiz 1

1.  $\frac{d}{dx} \sin(2x) = \cos(2x) \cdot 2 = 2 \cos 2x.$
2.  $\sin(2x) = \sin(x + x) = \sin x \cos x + \cos x \sin x = 2 \sin x \cos x.$
3.  $\frac{d}{dx} (2 \sin x \cos x) = 2 \cos x \cos x + 2 \sin x (-\sin x) = 2 \cos^2 x - 2 \sin^2 x.$
4.  $\frac{d}{dx} \cos(2x) = -\sin(2x) \cdot 2 = -2 \sin 2x.$
5.  $\cos(2x) = \cos(x + x) = \cos x \cos x - \sin x \sin x = \cos^2 x - \sin^2 x.$
6.  $\frac{d}{dx} (\cos^2 x - \sin^2 x) = 2 \cos x (-\sin x) - 2 \sin x (\cos x) = -4 \sin x \cos x.$
7. Our answers are consistent. There are two things that we can do: differentiate and use trig identities. What we have shown is that we can do these in any order we like: if we use a trig identity and then differentiate, the result is the same as if we differentiate and then use a trig identity.

