

**Calculus I [1823–001] Quiz I**

**Q1]...** Suppose that  $f(6) = 4$ ,  $f(4) = 2$ ,  $f(2) = 6$  and that  $g(4) = 2$ ,  $g(6) = 4$ . Compute the following values.

- $(f \circ g)(6)$  This is equal to  $f(g(6)) = f(4) = 2$ .
- $(g \circ f)(6)$  This is equal to  $g(f(6)) = g(4) = 2$ .
- $(f \circ f)(2)$  This is equal to  $f(f(2)) = f(6) = 4$ .
- $(g \circ g)(6)$  This is equal to  $g(g(6)) = g(4) = 2$ .
- $(f \circ f)(4)$  This is equal to  $f(f(4)) = f(2) = 6$ .

**Q2]...** Prove that the cube of an odd integer is also an odd integer.

Let  $n$  be an odd integer. This means that  $n = 2x + 1$  for some other integer  $x$ . Therefore, the cube of  $n$  becomes

$$n^3 = (2x + 1)^3 = 8x^3 + 12x^2 + 6x + 1 = 2(4x^3 + 6x^2 + 3x) + 1$$

which clearly has a remainder of 1 when divided by 2. This means that  $n^3$  is indeed odd.