Practice – 1

Once you feel confident with composite functions, complete problems 1 to 5. Check your answers by going to the Solutions tab in Moodle.

Instructions: Answer each of the following practice questions on a separate piece of paper. Step by step solutions are provided under the Solutions tab. You will learn the material more thoroughly if you complete the questions before checking the answers.

1. If $h(x) = 2^x$ and $g(x) = x^2 - 1$, determine the composite function $(h \circ g)(x)$, and state its domain.

2. Given $f(x) = \frac{4}{x^2}$ and $g(x) = \sqrt{x}$, find the following composite functions. State the domain of each.

3. Three functions are defined as $r(t) = \sqrt{t-7}$, $s(t) = t^2$, and $w(t) = 2t$. Find $(r \circ s \circ w)(2)$.

4. Given $f(x) = \sqrt{1-x}$ and $g(x) = \sqrt{3-x}$, determine the domain of $(f \circ g)(x)$.

5. The surface area, in centimetres, of a balloon is given by the function $A(r) = 4\pi r^2$. A pump is used to inflate the balloon so the radius, r, increases according to the function $r(t) = 3\sqrt{t+1}$, where t is the time in seconds. Express the surface area of the balloon as a composition of two functions, and then use that function to determine the surface area of the balloon at $t = 5\ s$ as an exact value.