

(1) [5] Let  $H(x) = \csc^3(\sqrt{x})$ . Find functions  $f$ ,  $g$  and  $h$  so that  $H = f \circ g \circ h$ .

(2) [5] Let  $f(x) = 3 + x$  and  $g(x) = 9 - x^2$ . Determine and simplify  $\left(\frac{f}{g}\right)(x)$  and state the domain.

(3) [5] A stone is dropped into a lake, creating a circular ripple which travels outward at a speed of 40 cm/s. Determine  $A(t)$ , the area of the circle as a function of time  $t$ . (Hint: first determine  $r(t)$ , the radius of the circle as a function of time.)