MATH 100 – WORKSHEET 7
THE CHAIN RULE

1. Direct problems

Fact. $(f(g(x)))' = f'(g(x))\,g'(x)$ *or* $\frac{\mathrm{d}}{\mathrm{d}x}(f(g(x))) = \frac{df}{dg}\cdot\frac{dg}{dx}$.

(1) Write the function as a composition and then differentiate.
   (a) $\sqrt{2x+1}$

   (b) e^{3x}

   (c) $(7x+\cos x)^n$.

Date: 25/9/2014.

(2) More difficult
   (a) Differentiate $7x + \cos(x^n)$

   (b) Differentiate $e^{\sqrt{\cos x}}$.

2. Inverse Functions

To find the inverse for $y = f(x)$: (1) "solve for x", get $x = g(y)$ (2) "exchange x, y" to get $g(x)$.

(1) Find the function inverse to $y = x^7 + 3$.
(2) Find the function inverse to $y = \sqrt{x - 1}$ on $x \geq 1$.
(3) Does $y = x^2$ have an inverse?