

**Some derivative problems**

Differentiate each of the following functions.

1.  $f(x) = x\sqrt{x}$

2.  $h(x) = \cos(x^2)$

3.  $f(x) = e^{x^2}$

4.  $f(x) = e^{3x}$

5.  $f(x) = e^{ax}$  where  $a$  is a constant

6.  $g(x) = x \cos(x^2)$

7.  $f(x) = x\sqrt{x^2 + 1}$

8.  $f(x) = e^{-x} \cos(x)$

9.  $f(t) = \ln(\sin t)$

10.  $f(x) = \frac{\ln x}{x^2}$