

1. (12 points) Find derivatives (with respect to x) for the following:

(i) $3x^2 + 2x + 1$

(ii) $\sqrt{x + \sqrt{2x}}$

(iii) $e^{x^2} \cos x$

(iv) $\frac{\tan x}{x}$

i) $6x + 2$

ii) $\frac{1}{2} (x + \sqrt{2x})^{-\frac{1}{2}} \left(1 + \frac{1}{2} (2x)^{-\frac{1}{2}} \cdot 2 \right)$

iii) $2x e^{x^2} \cos x - e^{x^2} \sin x$

iv) $\frac{x \sec^2 x - \tan x}{x^2}$