Compute the following derivatives. In these problems $a$, $b$, and $c$ are constants.

(1) $y = 3xe^x$
\[ y' = \]

(2) $A = 6re^{r^2}$
\[ \frac{dA}{dr} = \]

(3) $w = \sqrt{ze^{2z}}$
\[ \frac{dw}{dz} = \]

(4) $C(q) = \frac{3q}{1 + 2q}$
\[ C''(q) = \]

(5) $F(t) = \frac{e^t}{2 + e^t}$
\[ F'(t) = \]