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

$$(1) \ y = 3xe^x$$

$$y' = \underline{\hspace{1cm}}$$

$$(2) A = 6re^{r^2}$$

$$\frac{dA}{dr} = \underline{\hspace{1cm}}$$

$$(3) \ w = \sqrt{z}e^{2z}$$

$$\frac{dw}{dz} =$$

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

$$C'(q) = \underline{\hspace{1cm}}$$

(5)
$$F(t) = \frac{e^t}{2 + e^t}$$

$$F'(t) = \underline{\hspace{1cm}}$$