Consider the given vector equation.

$$r(t) = 4e^t i + 5e^{-t} j$$

(a) Find $r'(t)$.

(b) Sketch the plane curve together with the position vector $r(t)$ and the tangent vector $r'(t)$ for the given value of $t = 0$.

Solution:

$$r(t) = 4e^t i + 5e^{-t} j$$

$$r'(t) = 4e^t i - 5e^{-t} j$$

For the given value of $t = 0$

the position vector

$$r(0) = 4i + 5j$$

the tangent vector

$$r'(0) = 4i - 5j$$