**Show your work!**

(1) Consider the vector-valued function given by the formula $\vec{r}(t) = \langle t(t+2), t(t+1)(t+2) \rangle$.

(a) Show algebraically that the graph of this vector-valued function lies on the curve with equation $y^2 = x^2(x+1)$.

(b) Use a calculator to graph $y^2 = x^2(x+1)$. Sketch the curve and place an arrow to indicate the direction of motion of $\vec{r}(t)$.

(c) Find the tangent line at $(8, -24)$.

(d) Find the tangent line at $(0, 0)$. (HINT: This is a trick question.)

- **Ten** book problems: #11.5.128; #12.1.61, 63, 66, 89, 90; #12.2.10, 24, 65, 66. For #11.5.128, find the equation of the line parallel through $(1, 0, 2)$ that is parallel to the plane with equation $x + y + z = 5$ and perpendicular to the line with symmetric equations

$$x = t$$
$$y = 1 + t$$
$$z = 1 - t$$

(**not** $z = 1 + t$).