24. Try to estimate the coordinates of the highest point and the leftmost point on the curve $x = te^t$, $y = te^{-t}$. Then find the exact coordinates. What are the asymptotes of this curve?

25–26 □ Graph the curve in a viewing rectangle that displays all the important aspects of the curve.

25. $x = t^4 - 2t^3 - 2t^2, \quad y = t^3 - t$

26. $x = t^4 + 4t^3 - 8t^2, \quad y = 2t^2 - t$

27. Show that the curve $x = \cos t$, $y = \sin t \cos t$ has two tangents at $(0, 0)$ and find their equations. Sketch the curve.

28. At what point does the curve $x = 1 - 2\cos^2 t$, $y = (\tan t)(1 - 2\cos^2 t)$ cross itself? Find the equations of both tangents at that point.

29. (a) Find the slope of the tangent line to the trochoid

37. Find the area under one arch of the trochoid of Exercise 34 in Section 10.1 for the case $d < r$.

38. Let $\mathcal{R}$ be the region enclosed by the loop of the curve in Example 2.
(a) Find the area of $\mathcal{R}$.
(b) If $\mathcal{R}$ is rotated about the x-axis, find the volume of the resulting solid.
(c) Find the centroid of $\mathcal{R}$.

39. Estimate the area of the region enclosed by each loop of the curve

$$x = \sin t - 2\cos t \qquad y = 1 + \sin t \cos t$$

40. If f' is continuous and $f'(t) \neq 0$ for $a \leq t \leq b$, show that the parametric curve $x = f(t)$, $y = g(t)$, $a \leq t \leq b$, can be put in the form $y = F(x)$. [*Hint:* Show that f^{-1} exists.]