10.1 (Webwork #14)

Eliminate the parameter to express

$$x = e^{3t}$$
$$y = \frac{1}{e^{6t}}$$

in the form $y = f(x)$

Similar Webwork practice: #15, 16, 17, 18, 20

Webwork Sketching parametric curve: # 10, 12

10.2 (Webwork #10)

Useful fact: $\frac{d^2y}{dx^2} = \frac{\left[\frac{d}{dt}\left(\frac{dy}{dx}\right)\right]}{\left[\frac{dx}{dt}\right]}$

Suppose $h(t)$ and $k(t)$ are differentiable functions of t. Consider the parametric curve

$$\begin{cases} x = h(t) \\ y = k(t) \end{cases}, \text{ where } y \text{ is also a differentiable function of } x.$$

Suppose you have computed $\frac{d}{dt}\left(\frac{dy}{dx}\right) = \frac{-6}{(t^2-4)^2}$ and $\frac{dx}{dt} = 3t^2 - 12$

List the t-interval where the curve is concave upward.

$$\boxed{?} < t < \boxed{?}$$

Similar Webwork practice: #8, 9, 10, 12

10.3

1. Determine the polar coordinates of the two points at which the polar curves $r = 7\sin(\theta)$ and $r = 7\cos(\theta)$ intersect. Restrict your answers to $r \geq 0$ and $0 \leq \theta < 2\pi$.

   To input answers, list the two points in order of increasing values of r. If both points have the same value of r,, list them in order of increasing values of θ. If one of the intersection points is the pole, type "pole" in lower-case letters in both blanks for the first point.

   Intersection point 1: $(r, \theta) = (\_\_\_\_, \_\_\_\_)$
   Intersection point 2: $(r, \theta) = (\_\_\_\_, \_\_\_\_)$

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2. Consider the curves $r = 4$ and $r\cos\theta = 4$.
   At how many points do they intersect ?
   At what point/s do they intersect ?

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3. Consider the curves $\theta = \frac{\pi}{6}$ and $(x-4)^2 + (y+2)^2 = 1$.
   At how many points do they intersect ?
   At what point/s do they intersect ?

10.4

See Quiz 6 Study Guide