Wile E. Coyote's Flying Wing Suit

With the help of a handy Acme flying wing suit and some bird seed, Wile E. Cote will attempt to drop down from the sky to snatch the distracted Road Runner.



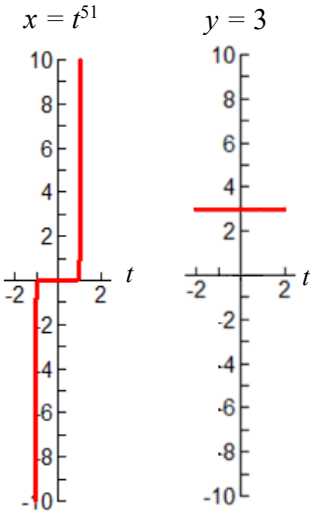
Click on the image to see the animation.



1. We will use the parametric equations $x(t) = t^{51}$, $y(t) = 3$ for the Road Runner's path. Before entering these into your grapher, discuss the following with your group.
   a. Describe the behavior of the graph of $x(t) = t^{51}$, shown to the right, for $-1 < t < 1$. What do you notice about his speed?

   b. Describe the behavior of the graph of $x(t)$, shown to the right, for $t < -1$ and $t < -1$. What do you notice about his speed?

   c. At $t = 0$ Road Runner is at position x _____ $y =$ _____ .



2. We will use the parametric equations $x(t) = e^{-t}$, $y(t) = e^{-t} + 3$ for Wile E. Coyote's path. Before entering these into your grapher, discuss the following with your group.

   a. i. Eliminate the parameter to report the path in terms of y and x.

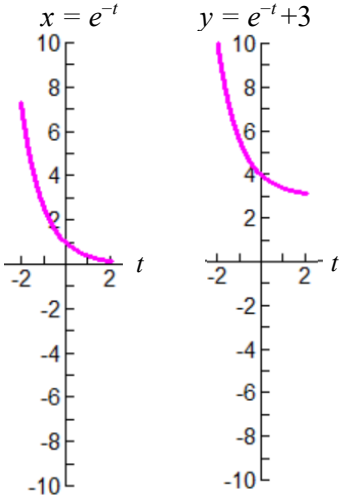
   $y(x) =$ _____ (This is called an *explicit* form.)

   ii. What kind of function is this?_____

   iii. Complete: As x increases, the graph of $y(x)$ _____.
   {increases, decreases}

   As t increases, the graph of $y(x)$ _____.
   {increases, decreases}

   b. On $-2 \le t \le 2$, does Wile E. Coyote ever reach Roadrunner? YES NO



3. Press [y=], enter the formulas into your grapher. Press [window] to change the window settings to simulate this from $-2 \le t \le 2$ with Tstep = 0.01. Press [graph].

4. Finale: The parametric equations $x = -\sqrt{t}$, $y = -4.9t + 3$ simulate the image to the right. Eliminate the parameter to report the path explicitly in terms of y and x.

   $y(x) =$ _____ , $x \le 0$



Click on the image to see the animation.