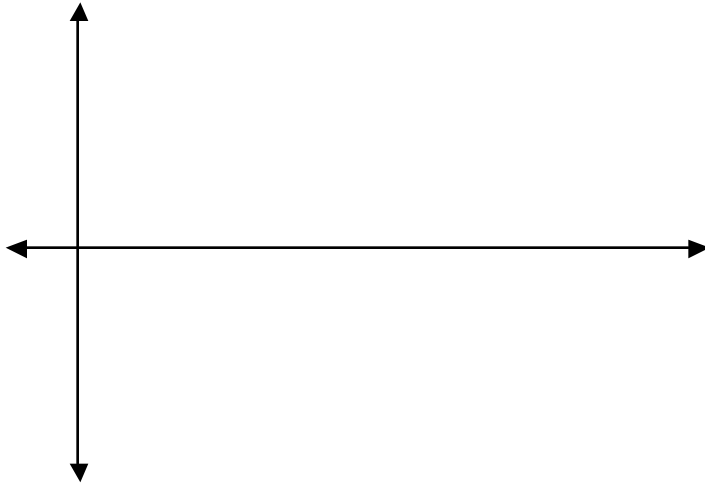


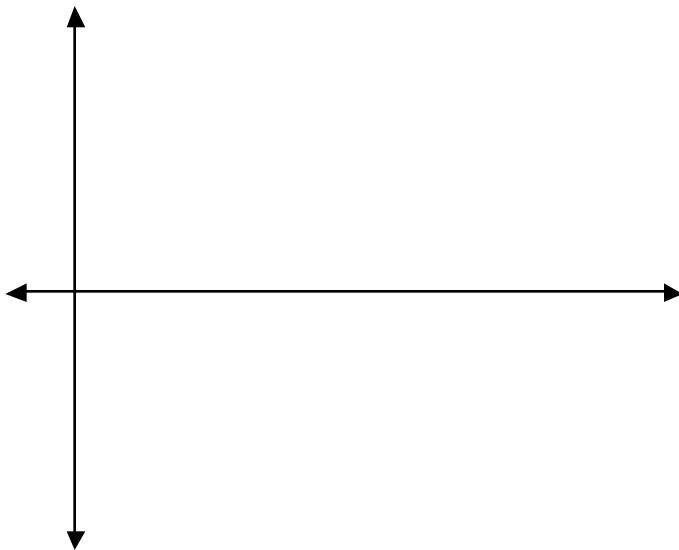
## Euler 3

Sketch each of the following rate equations  $y'$  (using - - -) on the axes below. Then use Euler's Method with a relatively small step size on your calculator for the interval given to find a good approximation for  $y = f(x)$ . On the same axes, make a careful sketch of  $y$  (using —). You will need to choose and mark an appropriate  $y$ -scale and step size. Make both graphs **carefully**.

(1)  $y' = 4 - x$  for  $x \in [0, 8]$  with  $y(0) = 0$



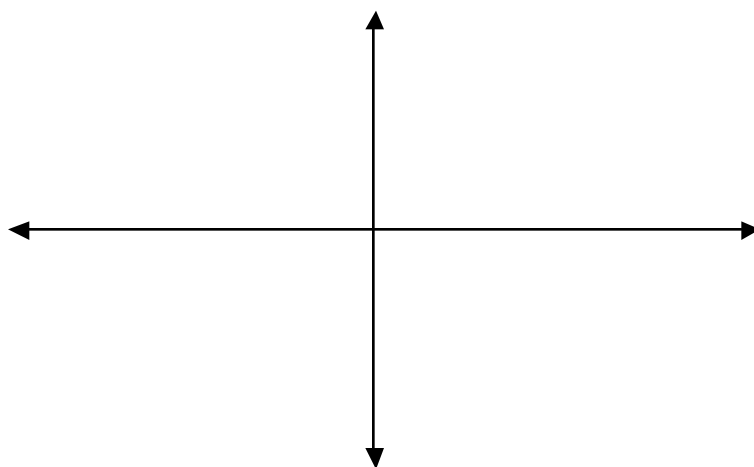
(2)  $y' = 4x - x^2$  for  $x \in [0, 6]$  with  $y(0) = -2$



(3)  $y' = \cos x$  for  $x \in [0, 6.28]$  with  $y(0) = 0$



(4)  $y' = \frac{1}{x^2 + 1}$  for  $x \in [-4, 4]$  with  $y(-4) = -1.6$



Now, using these examples, discuss patterns with others at your table. Write down any relationships you find between  $y$  and  $y'$ . Make sure that your conjectures are true for all four of your examples. Be as precise as possible. Consider what's positive, negative, increasing, decreasing, and the way each function curves.