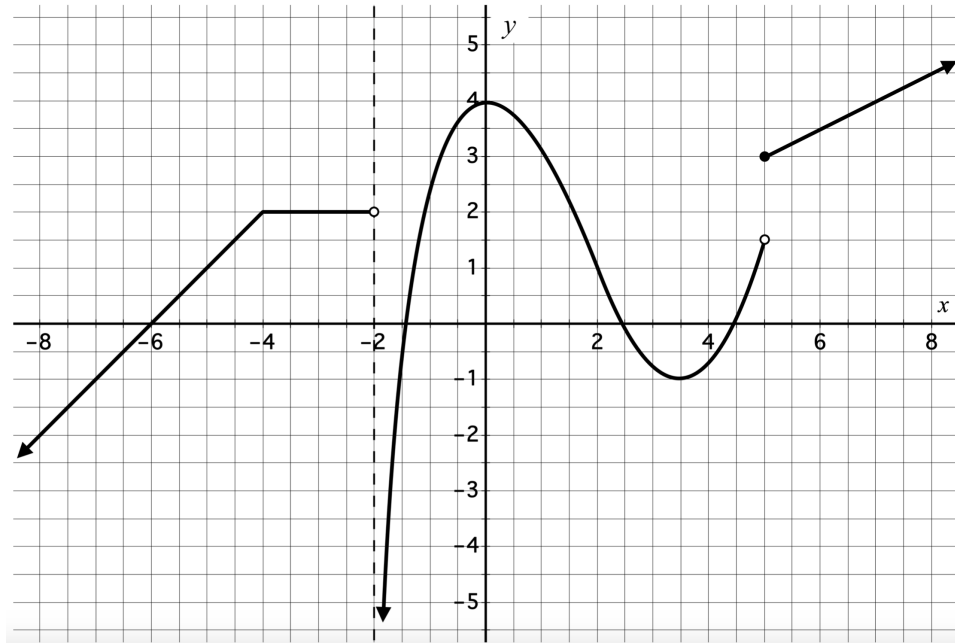
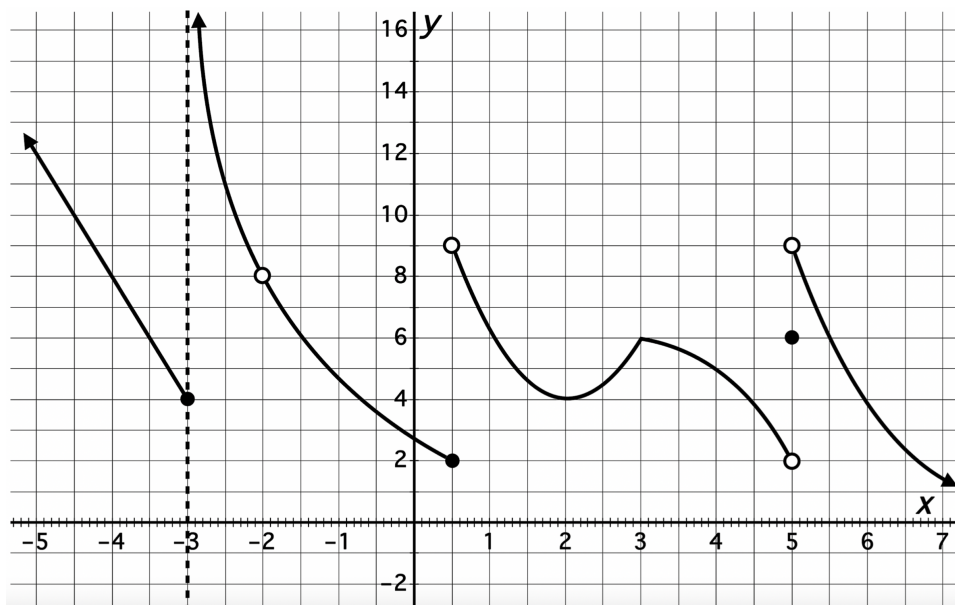


## Differentiability and Local Linearity

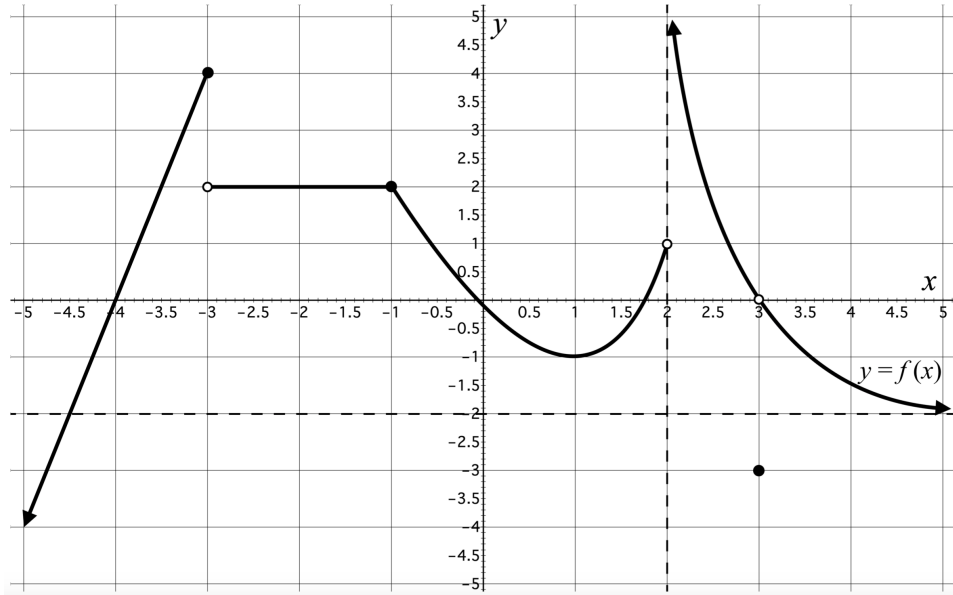
1. Use the fact that  $\sin(\theta)$  is locally linear for small angles to approximate the value of  $\sin(.00001)$ .
2. For which  $x$ -values is the function  $f$  (represented in the graph below) not locally linear? For which values of  $x$  is  $f$  continuous but not differentiable?



3. For which  $x$ -values is the function  $f$  (represented in the graph below) not locally linear? For which values of  $x$  is  $f$  continuous but not differentiable?



4. For which  $x$ -values is the function  $f$  (represented in the graph below) not locally linear? For which values of  $x$  is  $f$  continuous but not differentiable?



5. Approximate  $\pi^2$  using the local linearity of  $x^2$  for all values of  $x$ .