

DAY 59 WARM UP

**2007 AP<sup>®</sup> CALCULUS AB FREE-RESPONSE QUESTIONS**

6. Let  $f$  be the function defined by  $f(x) = k\sqrt{x} - \ln x$  for  $x > 0$ , where  $k$  is a positive constant.
- (a) Find  $f'(x)$  and  $f''(x)$ .
  - (b) For what value of the constant  $k$  does  $f$  have a critical point at  $x = 1$ ? For this value of  $k$ , determine whether  $f$  has a relative minimum, relative maximum, or neither at  $x = 1$ . Justify your answer.
  - (c) For a certain value of the constant  $k$ , the graph of  $f$  has a point of inflection on the  $x$ -axis. Find this value of  $k$ .
- 

**WRITE ALL WORK IN THE PINK EXAM BOOKLET.**

**END OF EXAM**