

CALCULUS BC  
SECTION II, Part A

Time—45 minutes

Number of problems—3

A graphing calculator is required for some problems or parts of problems.

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1. Let  $R$  be the region in the first and second quadrants bounded above by the graph of  $y = \frac{20}{1+x^2}$  and below by the horizontal line  $y = 2$ .
- (a) Find the area of  $R$ .
  - (b) Find the volume of the solid generated when  $R$  is rotated about the  $x$ -axis.
  - (c) The region  $R$  is the base of a solid. For this solid, the cross sections perpendicular to the  $x$ -axis are semicircles. Find the volume of this solid.
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WRITE ALL WORK IN THE PINK EXAM BOOKLET.