MATH1131/1141 Calculus Test 2 2009 S1 v1a

January 27, 2015

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We cannot guarantee that our answers are correct - please notify us of any errors or typos at unswmathsoc@gmail.com, or on our Facebook page. There are sometimes multiple methods of solving the same question. Remember that in the real class test, you will be expected to explain your steps and working out.

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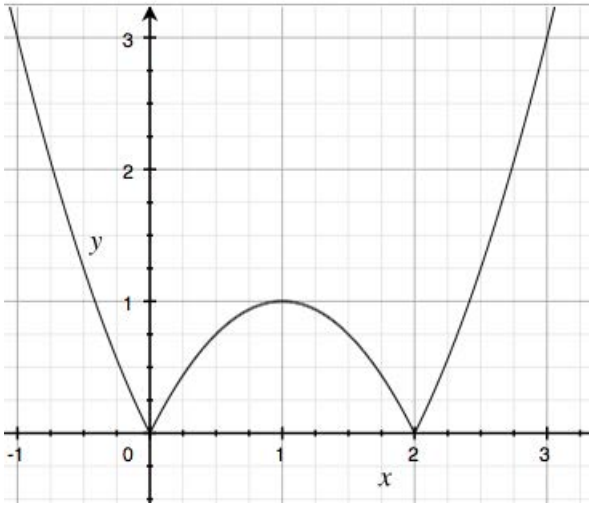
1. To find the value, consider the limit at this pint. It is found that for it to be continuous,

$$f(2) = 1.$$

2. Continuity condition is if the two sided limits agree with $f(1)$. Differentiability condition requires using the definition of the derivative. The values are $a = \frac{\pi}{2}$ and $b = 1 - \frac{\pi}{2}$.

3. (i) Sketch $y = x^2 - 2x$, then reflect anything below the x-axis above.



From this, note that critical points are stationary points and points where the derivative does not exist.

The critical points are $(0, 0)$, $(2, 0)$, $(1, 1)$, and $(5, 15)$.

(ii) Absolute minimum at $x = 0$ or 2. Absolute maximum at $x = 5$.

4. L'Hopital's rule will help. Limit is 3.