DATA_605_Discussion_13

Joshua Sturm

May 3, 2018

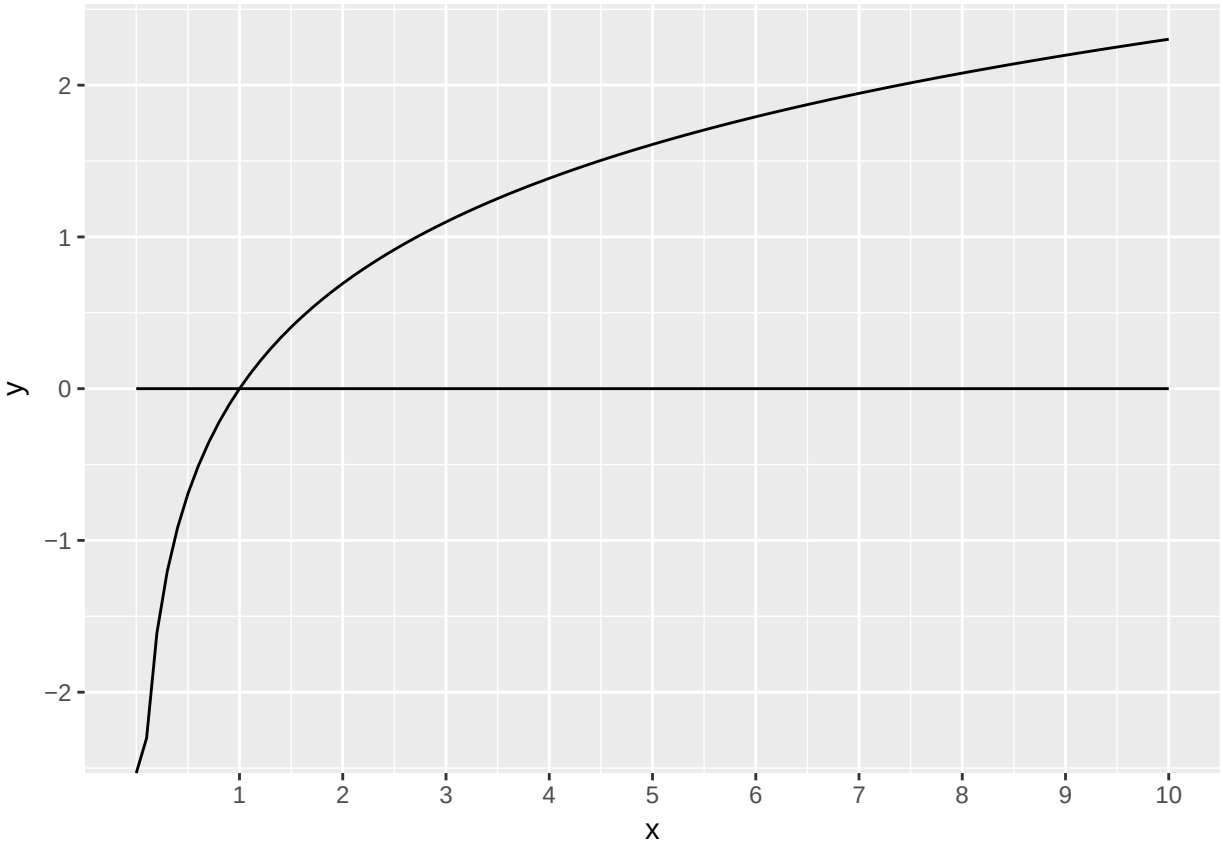
Section 4.1, Page 163, Exercise #7

Use 5 iterations of Newton's Method with the given initial approximation to approximate the root. Compare it to the known value of the root.

$$f(x) = \ln(x), \quad x_0 = 2$$

Formula for Newton's Method:

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$



$$\frac{\mathrm{d}}{\mathrm{d}x} = \frac{1}{x}$$

Iteration	Newton Approximation	Actual Value	Difference
1	0.6137056	1	0.3862944

Iteration	Newton Approximation	Actual Value	Difference
2	0.9133412	1	0.0866588
3	0.9961317	1	0.0038683
4	0.9999925	1	0.0000075
5	1.0000000	1	0.0000000