Math 240 — Hw 6
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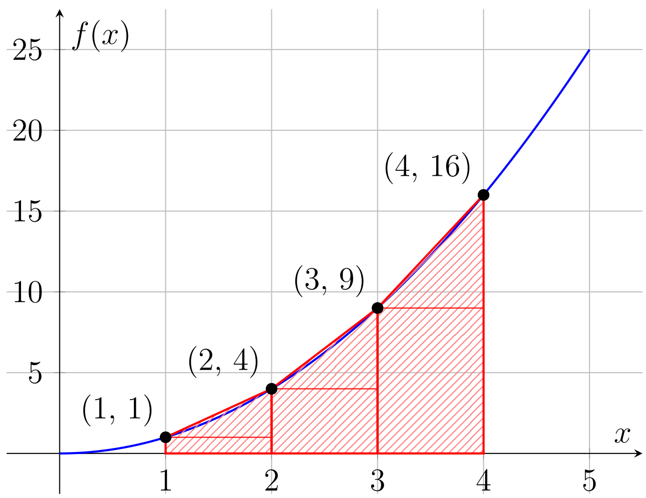
We stated in class that computing anti-derivatives from a specific point to another is an area under the curve. We can approximate this with rectangles and triangles.



For this problem, we can estimate the area under this curve from 1 to 4 by computing the areas explicitly.
The first column can be approximated by the area $\frac{1}{2}(1)(3) = \frac{3}{2}$ (for the triangle) and $(1)(1) = 1$ is the area. The total area is $\frac{5}{2}$.
The second column can be approximated by the area $\frac{1}{2}(1)(5) = \frac{5}{2}$ (for the triangle) and $(1)(4) = 4$. The total area $\frac{13}{2}$.
THe third column can be approximated by the area $\frac{1}{2}(1)(7) = \frac{7}{2}$ (for the triangle) and $(1)(9) = 9$. The total area $\frac{25}{2}$.
Putting these all together, we get the area $\frac{5}{2} + \frac{13}{2} + \frac{25}{2} = \frac{43}{2}$.
Some things to notice: first, the y-values are coming from the function x^2. The area of a rectangle is base times height. And the area of a triangle is half of base times height.

1. Estimate the area under 2^x for x-values between 1 and 4.

2. Estimate the area under x^3 for x-values between 1 and 3.