Math 171 – Quiz 8 Name Key

Write the function which, when derived, produces the function on the right hand side (aka, the antiderivative).

$\frac{d}{dx}($ Sec X $) = sec\, x\, tan\, x$

$\frac{d}{dx}($ sin X $) = cos\, x$

$\frac{d}{dx}($ tan X $) = sec^2 x$

$\frac{d}{dx}($ cos X $) = -sin\, x$

$\frac{d}{dx}($ Csc X $) = -csc\, x\, cot\, x$

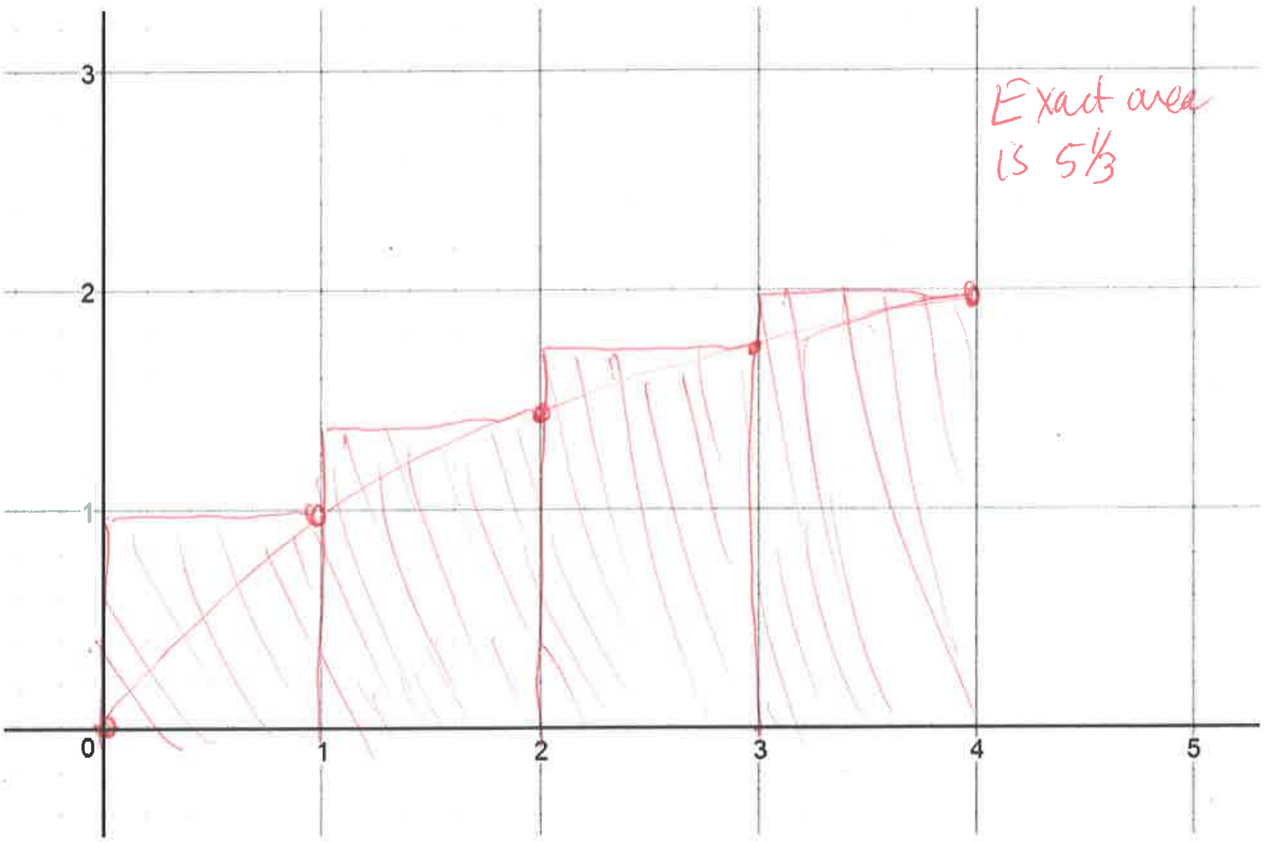
$\frac{d}{dx}($ cot X $) = -\; csc^2 x$

$\frac{d}{dx}($ $\tan^{-1} X$ $) = \frac{1}{1+x^2}$

$\frac{d}{dx}($ $\sin^{-1} X$ $) = \frac{1}{\sqrt{1-x^2}}$

$\frac{d}{dx}($ $\sec^{-1} X$ $) = \frac{1}{|x|\sqrt{x^2-1}}$

Math 171 – Quiz 9 Name Key



For the function $f(x) = \sqrt{x}$ on the interval [0, 4],

$f(x) =$

x	$\sqrt{x}$
0	0
1	1
2	1.414
3	1.732
4	2

1) Sketch the graph of f(x), and represent the R_4 (right sum) estimation of the area under the curve using 4 rectangles.

2) Calculate R_4, the right-handed sum.

$R_4 = 1[1 + 1.414 + 1.732 + 2] = 6.146$

$\Delta x = 1$

3) How does the estimation R_4 compare to the actual area under the curve? How could you obtain a closer estimation?

R_4 is an overestimation (larger than actual area) because f(x) is continually increasing.
M_4, a midpoint sum, would give a better estimate.
Or use more rectangles or average R_4 and L_4