Quiz 9 3.9 and 4.1

(1) Find the most general antiderivative of the function given. What notation would be used for this antiderivative (i.e. f(x), f'(x), F(x) ...)?. (Tip: you can check you answer by differentiation =))

a) $f(x) = 4x^3 + 2\sin x$

$F(x) = x^4 - 2\cos x + C$

b) $g'(x) = 5\sqrt{x} - 7x^{2/3} = 5x^{1/2} - 7x^{2/3}$

$g(x) = \frac{10}{3}x^{3/2} - \frac{21}{5}x^{5/3} + C$

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2) Using the graph, estimate the area under the graph of f(x) over [0,3] using 6 rectangles with sample points being left endpoints. Draw rectangles.

$\Delta x = \frac{b-a}{n} = \frac{3-0}{6} = \frac{1}{2}$

$A \approx f(0)\Delta x + f(\frac{1}{2})\Delta x + f(1)\Delta x + f(\frac{3}{2})\Delta x + f(2)\Delta x + f(\frac{5}{2})\Delta x$

$(f(0) + f(\frac{1}{2}) + f(1) + f(\frac{3}{2}) + f(2) + f(\frac{5}{2}))\Delta x$

$\approx (0 + 1 + 2 + 4 + 6 + 8)\frac{1}{2}$

$\frac{21}{2}$

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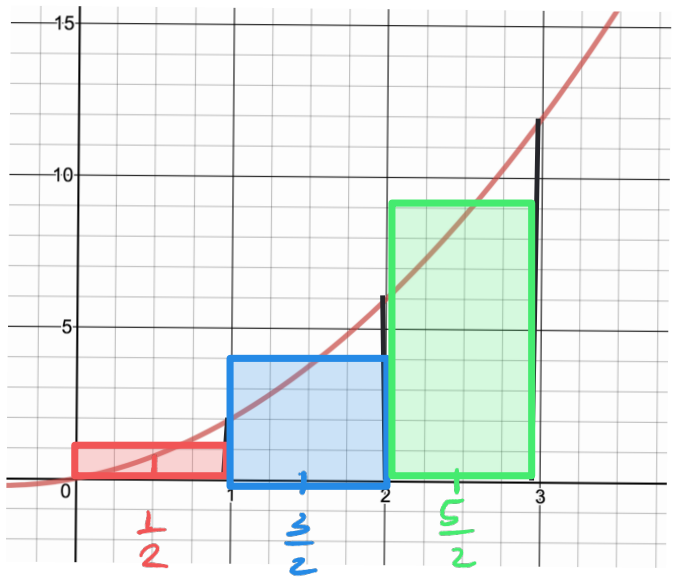
3) Using the graph, estimate the area under the graph of f(x) over [0,3] using 3 rectangles with sample points being midpoints. Draw rectangles.



$\Delta x = \frac{b-a}{n} = \frac{3-0}{3} = 1$

$f(1/2)\Delta x + f(\frac{3}{2})\Delta x + f(\frac{5}{2})\Delta x$

$(1 + 4 + 9)(1)$

14