Math 180: Calculus I **Fall 2014**

November 18

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1. Express as a definite integral: $\lim_{\Delta \to 0} \sum_{k=1}^{n} (x_k^{*2} + 1)\Delta x_k$ on $[0, 2]$

2. Suppose $\int_1^4 f(x)dx = 8$ and $\int_1^6 f(x)dx = 5$. Evaluate the following integrals

   (a) $\int_1^4 (-3f(x))dx$

   (b) $\int_6^4 12f(x)dx$

3. Consider two functions f and g on $[1, 6]$ such that $\int_1^6 f(x)dx = 10$, $\int_1^6 g(x)dx = 5$, $\int_4^6 f(x)dx = 5$, and $\int_1^4 g(x)dx = 2$. Evaluate the following

   (a) $\int_1^4 (f(x) - g(x))dx$

   (b) $\int_4^6 (g(x) - f(x))dx$

   (c) $\int_4^1 2f(x)dx$

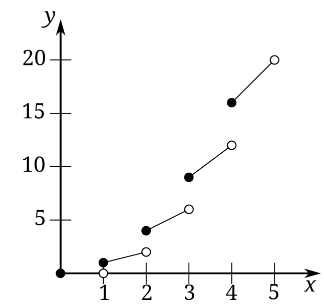
4. Use the definition of a definite integral as a limit of a left Riemann sum to evaluate the definite integrals

   (a) $\int_1^3 (2x + 1)dx$

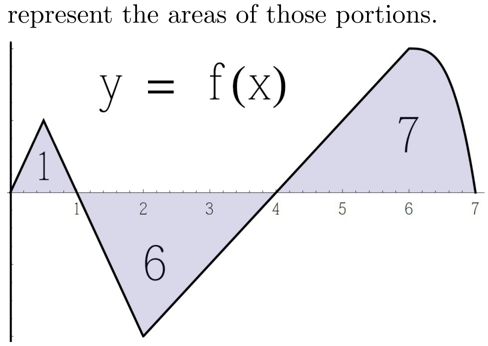
   (b) $\int_0^2 (x^2 - 1)dx$

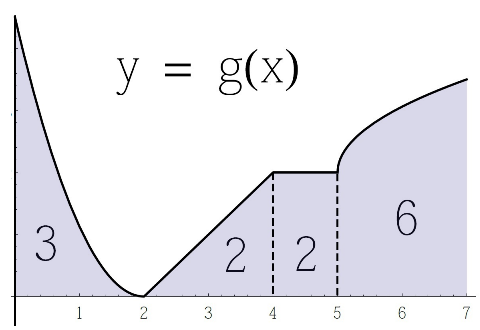
5. Remember the floor function $\lfloor x \rfloor$ is the greatest integer less than or equal to x. Evaluate the following integral:

$$\int_1^5 x\lfloor x \rfloor dx$$



6. The graphs below represent two functions, $f(x)$ and $g(x)$ and the values inside the enclosed portions represent the areas of those portions.





   (a) Compute $\int_0^4 (2f(x) + 3g(x))dx$

   (b) Compute $\int_7^4 f(x)dx$