Math 152
Exam 1 Answers

1. Distance traveled $\approx 2(2+1+1.5+2) = 13$ feet

2. $f(x) = -\frac{1}{2}\cos(2x) + e^2 x + \frac{5}{2}$

3. (a) $\displaystyle\int (2e^x + \frac{3}{x} - \sqrt[3]{x})\,dx \;=\; 2e^x + 3\ln|x| - \frac{3}{4}x^{4/3} + C$

   (b) $\displaystyle\int_0^4 |2t-4|\,dt \;=\; \int_0^2 (4-2t)\,dt + \int_2^4 (2t-4)\,dt \;=\; 4+4 \;=\; 8$

   (c) $\displaystyle\int_1^4 \frac{dx}{\sqrt{x}(1+\sqrt{x})^2} \;=\; \frac{1}{3}$ (Substitute with $u = 1+\sqrt{x}$ or $u = \sqrt{x}$)

   (d) $\displaystyle\sum_{i=2}^{4} (-1)^i \cdot (3+i^2) \;=\; 14$

4. Area $= \displaystyle\int_{-4}^{4} (8 - \frac{1}{2}y^2)\,dy \;=\; \frac{128}{3}$ square units

5. $h'(x) = [\ln(\tan(x)) + 4] \cdot \sec^2(x) \quad \Rightarrow \quad$ Slope $= h'(\frac{\pi}{4}) = 8$