Notes

Example 1. Compute $\int 4x^6 e^{x^7} \, dx$.

Example 2. Compute $\int x^2 (5x^3 + 6)^{10} \, dx$.

Example 3. Compute

$$\int \frac{1}{\sqrt[5]{1-3t}}\, dt.$$

Example 4. Find a function f whose tangent line has the slope

$$\frac{2+\sqrt[3]{x}}{3\sqrt[3]{x^2}}$$

for all nonzero x and whose graph passes through the point $(1, \frac{5}{2})$.

Example 5. You arrive at 6 am to a crime scene and discover a body. Analysts have determined that in the present conditions the temperature of the body would decrease at a rate of

$$T'(t) = -11.82e^{-0.788t}$$

degrees Celsius per hour. The core temperature of the body at 6 am read to be $27°C$. Assuming that the average person has a core temperature of $37°C$, determine the time of death to the nearest minute.

Example 6. Instead of living in a dorm, you decide to buy a house while at Purdue. You find one appraised at \$60,000, and according to latest market trends, the value of the house will increase at a rate of

$$H'(t) = \frac{3.7t^4}{\sqrt{0.5t^5 + 9000}}$$

dollars per year. What will the house be worth if you sell it after graduating? (You may assume it only takes 4 years to graduate.)