The Fundamental Theorem of Calculus Part 1

1. Let $F'(x) = f(x)$. Given that $\int_3^8 f(x)\,dx = 5$ and $F(3) = 12$, what is the value of $F(8)$?

   (a) 13

   (b) 60

   (c) -7

   (d) 17

   (e) There is not enough information to answer this question.

2. $\int_3^{\cos(\theta)} t^2 \sec(5t^3+4)\tan(5t^3+4)\,dt =$

3. $\int_{-x}^{x^2} \frac{25}{t^2} - 51\sin(t) + 91.2\,dt =$

4. The amount of energy an office building consumes (in kilowat-hours per week) is approximated by $f(t) = 12.64e^{0.5621t}$, where t is in weeks since January 1, 2020. Energy consumption costs 12 cents per kilowat-hour. How much does does energy cost for the office building during the months of January, February, and March? Give an exact answer.

5. $\int_1^4 \frac{dt}{2\sqrt{t}} =$

6. $\int_{\frac{3}{4}}^1 \sec^2(\pi x)\,dx =$