

Lesson 7.2.2

7-67. See below:

- a. $(x^3 + 5)^2 + C$
- b. $\frac{3}{8} (x^4 + 1)^{1/2} + C$

7-68. See below:

- a. $-\frac{1}{5} \cos(x^5) + C$
- b. $-\frac{1}{72} (-3x^4 + 2)^6 + C$
- c. $\frac{1}{30} \sec(10x^3) + C$
- d. $\frac{1}{300} (-3 + 5x^6)^{10} + C$
- e. $\frac{1}{2 \ln(5)} 5^{10x^5 + 1} + C$
- f. $\frac{5}{52} (x^4 + 4x + 5)^{13/5} + C$

7-69. See below:

- a. When $x = 300$, $\theta \approx 0.359$ rad. Since $x = 800 \tan \theta$, $\frac{dx}{dt} = 800 \sec^2(\theta)$ $\frac{d\theta}{dt} = 286.67 \frac{\text{ft}}{\text{sec}}$.
- b. Because the truck is far away from the building.



7-70. See below:

- a. $3u^2 - u - 10 = 0$, $u = -\frac{5}{3}, 2$
- b. $x = \tan^{-1}(-\frac{5}{3}) \approx -1.030 + \pi n$, $x = \tan^{-1}(2) \approx 1.107 + \pi n$

7-71. $\frac{64}{11} \frac{\text{ft}}{\text{sec}} \approx 5.818 \frac{\text{ft}}{\text{sec}}$

7-72. See below:

- a. $2 \cos(2x)e^{\sin(2x)}$
- b. $\frac{-2}{\cos(2x)} \sin(2x)$ or $-2 \tan(2x)$
- c. 1

7-73. See below:

- a. $-e^{\cos(2x)} + C$
- b. $-\frac{1}{48}(6x - 2)^8 + C$
- c. $\frac{1}{4}(\ln x)^2 + C$

7-74. 1.942 miles east, 1.954 miles north

7-75. See below:

- a. discont at $x = -1$, non-dif at $x = -1, 3$
- b. non-dif at $x = 2$

7-76. See below:

- a. 5 seconds
- b. 165 feet

7-77. The function has a *relative* max at $x = 3$. They cannot determine the location of the *absolute* maximum based on the given information. For example, $f(x) = -\frac{x(x-3)^2}{3}$ has no absolute max.

7-78. See below:

- a. $x = 15$
- b. $F(x)$ is strictly increasing on $[0, 8]$.
- c. $4\pi, 4\pi + \frac{156}{7}$, and $4\pi + 33$
- d. $4 < x < 8$