Section 2.2

Assigned problems: 1-5, 8, 9, 13-17, 19, 20, 22, 24-27, 34, 35, 36, 37, 40.

Selected solutions:

1. $y(x) = C e^{\frac{x^2}{2}}$

2. $y(x) = C x^2$

3. $y(x) = \ln(e^x + C)$

4. $y(x) = \tan(e^x + C)$

5. $y(x) = C e^{x + \frac{x^2}{2}}$

8. $y(x) = C e^x (x - 1)$

9. $y(x) = e^{C e^{\arctan(x)}}$

13. $y(x) = -2x$ The interval of existence is $\mathbb{R}$.

14. $y(t) = \sqrt{-1 + 2 e^{-2 t^2}}$ The interval of existence is $\left[-\sqrt{\frac{\ln(2)}{2}}, \sqrt{\frac{\ln(2)}{2}} \right]$

15. $y(x) = \sqrt{1 - 2 \cos(x)}$ The interval of existence is $\left[-\frac{\pi}{3}, \frac{\pi}{3} \right]$

16. $y(x) = -\ln(2 - e^x)$ The interval of existence is $(-\infty, \ln 2]$

17. $y(x) = \tan\left(\frac{\pi}{4} + x \right)$ The interval of existence is $\left(-\frac{3\pi}{4}, \frac{\pi}{4} \right)$

19. Solutions $y(x) = \sqrt{1 + x^2}$ and $-\sqrt{1 + x^2}$. Intervals of existence $\mathbb{R}$.

20. Solutions $y(x) = \sqrt{4 - x^2}$ and $-\sqrt{4 - x^2}$. Intervals of existence $[-2, 2]$.

22. $y(x) = \sqrt{-1 + 5 e^{2 (x-1)}}$.   The interval of existence is $\left(1 - \frac{1}{2} \ln(5), +\infty \right)$

24. Done in class.

25. Done in class.

26. (a) 1.55066×10^{-8}; (b) 1.4849×10^{8}

27. 14.2584 hours.

30. 89.1537 mg

34. (b) 3878.99 years

35. (a) done in class. (b) 19:47:15

36. 56.1842°F

37. 5 minutes 51 seconds.

40. $y(x) = 2\sqrt{x + C}$.