Homework 20
Due Dec 13 (all sections)

From the 2nd edition: section 9.1 (pp. 507-508):

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 25, 31, 37, 41.

The changes in the 1st edition: section 9.1 (pp. 521-522):

3 → 3, but the differential equation is \( y' - 8x = 0 \)
5 → 6, but the ‘solution’ to verify is \( y = 25e^{-2x^2} \)
7 → 8
9 → 10, except (b) becomes (b) \( \sqrt{4 - x^2}y' = e^{3y} \sin x \).
11 → Consider the differential equation \( y^3y' - 9x^2 = 0 \).
   a) Write it as \( y^3 \, dy = 9x^2 \, dx \).
   b) Integrate both sides to obtain \( \frac{1}{4}y^4 = 3x^3 + C \).
   c) Verify that \( y = (12x^3 + C)^{1/4} \) is the general solution.
   d) Find the particular solution satisfying \( y(1) = 2 \).
13 → Use separation of variables to find the general solution to \( y' + 4xy^2 = 0 \)
15 → Same as 13 except \( \frac{dy}{dt} - 20te^{-y} = 0 \)
17 → Same as 13, 15 except \( 2y' + 5y = 4 \)
19 → 20
31 → 31, except the initial value problem is \( y(0) = -2 \)
37 → 35
41 → 40.