

MATH 1920 - CHAPTER 7 PRACTICE

- Determine if $y = Cx^3$ is a solution of the third order differential equation:
 $x^3y''' + x^2y'' - 3xy' - 3y = 0$
- BONUS: Prove that $y^2 - x^2 - xy = C$ is a solution of the first order differential equation:
 $(x - 2y)y' + 2x + y = 0$
- #8 on page 508; use $c = 1, 2, 3$ for part c)
- #12 on page 513
- Solve the differential equation: $x^2y' - yx^2 = y$ [solve answer for y]
- Solve the differential equation: $x \cos^2 y - \frac{dy}{dx} \sec x = 0$ [do not solve answer for y]
- Find the particular solution of the differential equation that satisfies the given condition:
 $\sqrt{xy}' - \sqrt{y} = x\sqrt{y}$ and $y = 4$ when $x = 9$ [solve answer for y]
- A curve passes through $(3, 10)$ and has the property that the slope of the curve at every point P is the square of the x -coordinate of P . What is the equation of the curve?
- A curve passes through $(0, 3)$ and has the property that the slope of the curve at every point P is the product of the coordinates of P . What is the equation of the curve?

Refer to #13 on page 533 for a discussion of Newton's Law of Cooling. See solution to #14 on my web site for one method of solution.

- On a hot day in Phoenix the temperature may reach 120°F . On such a day an outdoor thermometer is taken inside a grocery where the temperature is 68°F .
 - If the thermometer reads 100°F after one minute, what will the reading be after two more minutes?
 - When will the thermometer read 70°F ?
- The temperature within a food freezer is -16°C and the room temperature is a constant 20°C . At 11 PM the power goes off, and at 6 AM the next morning the temperature in the freezer has risen to -10°C . At what time will the temperature in the freezer reach the critical value of 0°C if the power remains off and the freezer is not opened?