

Math 260 Quiz # 1b

Name: Solution I.D. # _____ Serial # _____

1. Solve the initial value problem: $\frac{dy}{dx} = x\sqrt{x^2+7}$; $y(-3) = 0$

$$y(x) = \int x\sqrt{x^2+7} dx$$

$$= \frac{1}{2} \int (x^2+7)^{\frac{1}{2}} 2x dx$$

$$= \frac{1}{3} (x^2+7)^{\frac{3}{2}} + C$$

$$\text{Since } y(-3) = 0 \Rightarrow y(-3) = \frac{1}{3} (9+7)^{\frac{3}{2}} + C = 0$$

$$\Rightarrow C = -\frac{1}{3} (16)^{\frac{3}{2}} = -\frac{64}{3}$$

\therefore the solution for the IVP is

$$y(x) = \frac{1}{3} (x^2+7)^{\frac{3}{2}} - \frac{64}{3}$$

2. Verify that the function $y(x) = \ln(x+K)$ is a solution for the differential equation $e^y y' = 1$. Then find the constant K which satisfies the initial condition $y(0) = 0$.

See Version 'a'