MATH 102
QUIZ # 1

NAME: ..... SEC. #: . . . . . .

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Q1. Evaluate $\int (x^2-1)^2\,dx$

$$= \int (x^4 - 2x^2 + 1)dx = \frac{x^5}{5} - \frac{2x^3}{3} + x + C$$

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Q2. Evaluate $\int x\sqrt[4]{x-1}\,dx$

Let $u = x-1 \to x = u+1 \to dx = du$

$$= \int (u+1)u^{\frac{1}{4}}\,du = \int (u^{\frac{5}{4}} + u^{\frac{1}{4}})\,du$$

$$= \frac{4}{9}u^{\frac{9}{4}} + \frac{4}{5}u^{\frac{5}{4}} + C$$

$$= \frac{4}{9}(x-1)^{\frac{9}{4}} + \frac{4}{5}(x-1)^{\frac{5}{4}} + C$$

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Q3. Solve the initial-value problem

$$\begin{aligned} \frac{dy}{dx} &= \frac{1}{x} \\ y(-1) &= 5 \\ y &= \int \frac{1}{x}dx \\ &= \ln|x| + C \\ y(-1) &= 5 \to \ln|-1| + C = 5 \to C = 5 \\ y &= \ln|x| + 5 \end{aligned}$$