

QUIZ 1 SOLUTIONS: LESSON R
JANUARY 9, 2019

Write legibly, clearly indicate the question you are answering, and put a box or circle around your final answer. If you do not clearly indicate the question numbers, I will take off points. Write as much work as you need to demonstrate to me that you understand the concepts involved. If you have any questions, raise your hand and I will come over to you.

1. [5 pts] Evaluate $\int_1^8 \left(3x^2 + \frac{\sqrt[3]{x^2}}{2} \right) dx$.

$$\begin{aligned} & \int_1^8 \left(3x^2 + \frac{\sqrt[3]{x^2}}{2} \right) dx \\ &= \int_1^8 \left(3x^2 + \frac{1}{2} x^{2/3} \right) dx \\ &= \frac{3}{2+1} x^{2+1} + \frac{1}{2} \left(\frac{1}{\frac{2}{3}+1} \right) x^{\frac{2}{3}+1} \Big|_1^8 \\ &= \frac{3}{3} x^3 + \frac{1}{2} \left(\frac{1}{\frac{5}{3}} \right) x^{5/3} \Big|_1^8 \end{aligned}$$

2. [5 pts] Evaluate $\int \sec x (\sec x + \tan x) dx$.

$$\begin{aligned} \int \sec x (\sec x + \tan x) dx &= \int (\sec^2 x + \sec x \tan x) dx \\ &= \int \sec^2 x dx + \int \sec x \tan x dx \\ &= \boxed{\tan x + \sec x + C} \end{aligned}$$

$$\begin{aligned} \sqrt[3]{x^2} &= (x^2)^{1/3} = x^{2/3} \\ &= x^3 + \frac{1}{2} \left(\frac{3}{3} \right) x^{5/3} \Big|_1^8 \\ &= x^3 + \frac{3}{10} x^{5/3} \Big|_1^8 \\ &= 8^3 + \frac{3}{10} (8)^{5/3} - \left[1^3 + \frac{3}{10} (1)^{5/3} \right] \\ &= 512 + \frac{3}{10} (32) - 1 - \frac{3}{10} \\ &= 511 + \frac{96}{10} - \frac{3}{10} \\ &= \frac{5110}{10} + \frac{93}{10} = \boxed{\frac{5203}{10}} \end{aligned}$$