

Math 1121

Homework #27

#10, 29

$$\underline{\#10} \quad \int r \sqrt{5r^2+2} \, dr \quad \begin{array}{l} u = 5r^2+2 \\ du = 10r \, dr \rightarrow \frac{1}{10} du = r \, dr \end{array}$$

$$= \int r \sqrt{u} \, dr = \int u^{1/2} r \, dr = \int u^{1/2} \cdot \frac{1}{10} du$$

$$= \frac{1}{10} \int u^{1/2} du = \frac{1}{10} \cdot \frac{1}{3/2} \cdot u^{3/2} + C$$

$$= \frac{1}{15} (5r^2+2)^{3/2} + C$$

$$\underline{\#29} \quad \int \frac{(1+3\ln x)^2}{x} \, dx \quad \begin{array}{l} u = 1+3\ln x \\ du = 3 \cdot \frac{1}{x} \, dx \\ \frac{1}{3} du = \frac{1}{x} \, dx \end{array}$$

$$\int \frac{u^2}{x} \, dx = \int u^2 \cdot \frac{1}{x} \, dx = \int u^2 \cdot \frac{1}{3} du$$

$$= \frac{1}{3} \int u^2 du = \frac{1}{3} \cdot \frac{1}{3} u^3 + C$$

$$= \frac{1}{9} (1+3\ln x)^3 + C$$