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COMPUTER ENGINEERING,
19/ENG02/018.

ASSIGNMENT TITLE: CALCULUS
GENERAL MATHEMATICS III
MAT 104 .

$$1.) \int 4 \sec^2(3m+1) dm.$$

$$u = 3m + 1$$

$$du = 3 dm$$

$$dm = \frac{du}{3}$$

$$\int \frac{4 \sec^2 u du}{3}$$

$$\frac{4}{3} \int \sec^2 u du.$$

integration of $\sec^2 u$.

$$= \tan u + C.$$

$$\frac{4}{3} \tan u + C$$

$$\frac{4}{3} \tan(3m+1) + C$$

$$2) \int 2t \times (3t^2 - 1)^{1/2} dt$$

$$u = 3t^2 - 1$$

$$\frac{du}{dt} = \frac{6t}{6t} dt$$

$$dt = \frac{du}{6t}$$

$$\int 2t \times (u)^{1/2} \frac{du}{6t}$$

$$\int \frac{1}{3} \times u^{1/2} du$$

$$\frac{1}{3} \int u^{1/2} du$$

$$= \frac{1}{3} \times \frac{u^{1/2+1}}{1/2+1} + C$$

$$= \frac{1}{3} \times \frac{2}{3} u^{3/2} + C$$

$$= \frac{2}{9} u^{3/2} + C$$

$$= \frac{2}{9} (3t^2 - 1)^{3/2} + C$$

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

$$u = 4x^2 - 1$$

$$du = 8x dx$$

$$dx = \frac{du}{8x}$$

$$= \int 2x (u)^{-1/2} \frac{du}{8x}$$

$$= \frac{1}{4} \int u^{-1/2} du$$

$$= \frac{1}{4} \cdot \frac{u^{-1/2+1}}{-1/2+1}$$

$$= \frac{1}{4} \times \frac{u^{1/2}}{1/2}$$

$$= \frac{1}{4} \times 2u^{1/2}$$

$$= \frac{1}{2} u^{1/2} = \frac{1}{2} (4x^2-1)^{1/2}$$