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b. $\frac{dx}{x^2+64}$

$$\int \frac{dx}{(x^2+64)} = \int \frac{dx}{x^2+8^2}$$

Let $x = 8\tan\theta$

$$\frac{dx}{d\theta} = 8\sec^2\theta$$

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$$dx = 8\sec^2\theta\, d\theta$$

$$x^2+8^2 = 8^2+8^2\tan\theta = 8^2(1+\tan^2\theta)$$

$$= 64(1+\tan^2\theta)$$

$$\int \frac{8\tan^2\theta\, d\theta}{64\sec^2\theta} = \frac{1}{8}\int d\theta = \frac{1}{8}\tan^{-1}\frac{x}{8} + C$$