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$$1) \int \sqrt{4-x^2} dx \quad \begin{array}{l} \text{let } x=2\sin\theta \\ x^2=4\sin^2\theta \end{array} \quad dx=2\cos\theta d\theta$$

$$\int \sqrt{4-4\sin^2\theta} 2\cos\theta d\theta$$

$$\int 2\sqrt{1-\sin^2\theta} 2\cos\theta d\theta$$

$$4 \int \cos^2\theta d\theta$$

$$4 \int 1 + \cos 2\theta d\theta$$

$$4\left(\theta + \frac{1}{2}\sin 2\theta\right) + C$$

$$\begin{array}{l} \cos^2\theta = \frac{1+\cos 2\theta}{2} \\ \cos 2\theta = 1 - \cos^2\theta \end{array}$$

$$4\theta + 2\sin 2\theta + C$$

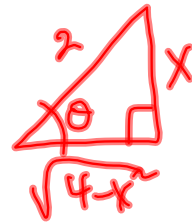
$$(4\sin^{-1} \frac{x}{2} + 4\sin\theta\cos\theta) + C$$

$$4\sin^{-1} \frac{x}{2} + 4\frac{x}{2} \left(\frac{\sqrt{4-x^2}}{2} \right) + C$$

$$4\sin^{-1} \frac{x}{2} + x\sqrt{4-x^2} + C$$

$\div 2 ?$

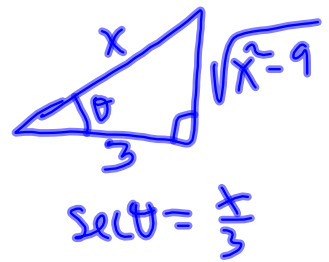
$$x = 2\sin\theta$$
$$\sin\theta = \frac{x}{2}$$



$$y = x^2 + b$$

$$7) \int \frac{\sqrt{x^2-9}}{x} dx \quad \text{let } x=3\sec\theta \quad dx=3\sec\theta\tan\theta d\theta$$

$$x^2=9\sec^2\theta$$



$$\int \frac{\sqrt{9\sec^2\theta-9}}{3\sec\theta} \cdot 3\sec\theta\tan\theta d\theta$$

$$\int 3\sqrt{\sec^2\theta-1} \tan\theta d\theta = 3 \int \tan^2\theta d\theta$$

$$3 \int (\sec^2\theta-1) d\theta = 3\tan\theta - 3\theta + C$$

$$= \frac{3\sqrt{x^2-9}}{\frac{x}{3}} - 3\sec^{-1}\frac{x}{3} + C$$

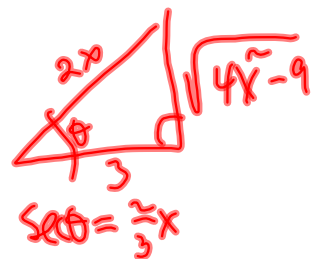
$$11) \int \frac{dx}{x^2 \sqrt{4x^2 - 9}} \quad \text{let } x = \frac{3}{2} \sec \theta \quad dx = \frac{3}{2} \sec \theta \tan \theta d\theta$$

$$x^2 = \frac{9}{4} \sec^2 \theta$$

$$\int \frac{\frac{3}{2} \sec \theta \tan \theta d\theta}{\frac{9}{4} \sec^2 \theta \sqrt{9(\sec^2 \theta - 1)}} = \frac{\frac{3}{2} \cdot \frac{4}{9} \cdot 1}{2} \int \frac{\sec \theta \tan \theta d\theta}{\sec^2 \theta \tan \theta}$$

$$= \frac{2}{9} \int \cos \theta d\theta = \frac{2}{9} \sin \theta + C$$

$$= \frac{2}{9} \frac{\sqrt{4x^2 - 9}}{x} + C$$



$$4\tilde{x} = a + b$$