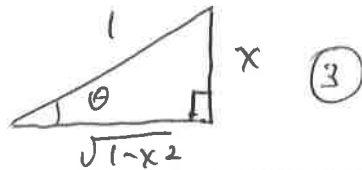


Quiz 6

Name: key Row: \_\_\_\_\_

Evaluate the integral  $\int \frac{x^2}{(1-x^2)^{3/2}} dx$ . Show all work. Remember to give your answer as a function of  $x$ .

Let  $\begin{cases} x = \sin \theta & \textcircled{1} \\ dx = \cos \theta d\theta & \textcircled{1} \end{cases}$



Then  $\int \frac{x^2}{(1-x^2)^{3/2}} dx = \int \frac{\sin^2 \theta \textcircled{1}}{(1-\sin^2 \theta)^{3/2} \textcircled{1}} \cos \theta d\theta =$

$= \int \frac{\sin^2 \theta}{(\cos^2 \theta)^{3/2}} \cos \theta d\theta = \int \frac{\sin^2 \theta}{\cos^3 \theta} \cos \theta d\theta =$

$= \int \frac{\sin^2 \theta}{\cos^2 \theta} d\theta = \int \tan^2 \theta d\theta =$

$= \int (\sec^2 \theta - 1) d\theta = \int \sec^2 \theta d\theta - \int 1 \cdot d\theta =$

$= \tan \theta - \theta + C$

$= \boxed{\frac{x}{\sqrt{1-x^2}} - \arcsin x + C}$