

Math Sheet

Name _____ Score _____ Teacher _____ Date _____

Substitution with Inverse Trigonometric Functions

Choose $u = g(x)$, convert the complete differential, integrate the inverse-trigonometric pattern in u , then substitute back and include $+ C$.

1. Use arccot:

$$\int \frac{\cos(-2-x)}{9+(2\sin(-2-x)-2)^2} dx$$

$$u = 2\sin(-2-x)-2$$

5. Use arctan:

$$\int \frac{\frac{1}{2}+3x}{1+(-1-x-3x^2)^2} dx$$

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

2. Use arcsec:

$$\int \frac{4}{|1-2x|\sqrt{(1-2x)^2-4}} dx$$

$$u = 1-2x$$

6. Use arcsin:

$$\int \frac{\frac{4}{3}}{\sqrt{9-(2\ln(-3-x)-1)^2}} dx$$

$$u = 2\ln(-3-x)-1$$

3. Use arccsc:

$$\int \frac{\frac{4}{-3-2x}}{|-2\ln(-3-2x)-1|\sqrt{(-2\ln(-3-2x)-1)^2-9}} dx$$

$$u = -2\ln(-3-2x)-1$$

7. Use arcsin:

$$\int \frac{2+12x-12x^2}{\sqrt{1-(-2-x-3x^2+2x^3)^2}} dx$$

$$u = -2-x-3x^2+2x^3$$

4. Use arccos:

$$\int \frac{-6\sin(2-2x)}{\sqrt{4-(\cos(2-2x)+0)^2}} dx$$

$$u = \cos(2-2x)+0$$

8. Use arccsc:

$$\int \frac{\frac{-3}{2}\sec(-2+3x)^2}{|\tan(-2+3x)-1|\sqrt{(\tan(-2+3x)-1)^2-16}} dx$$

$$u = \tan(-2+3x)-1$$
