

Math Sheet

Name _____ Score _____ Teacher _____ Date _____

Trigonometric Substitution Integrals

Choose the standard substitution, state its domain, simplify the radical, and back-substitute to x . Give exact values for definite integrals.

1. Evaluate exactly: $\int \sqrt{x^2 - 9} \, dx$. Use $x = 3 \sec(\theta)$; $x \geq 3$; $0 \leq \theta < \pi/2$.

2. Evaluate exactly: $\int_0^3 2\sqrt{9 + x^2} \, dx$. Use $x = 3 \tan(\theta)$; all real x ; $-\pi/2 < \theta < \pi/2$.

Math Sheet

Name _____ Score _____ Teacher _____ Date _____

Trigonometric Substitution Integrals

Choose the standard substitution, state its domain, simplify the radical, and back-substitute to x . Give exact values for definite integrals.

3. Evaluate exactly: $\int \sqrt{16 - x^2} \, dx$. Use $x = 4 \sin(\theta)$; $|x| \leq 4$; $-\pi/2 \leq \theta \leq \pi/2$.

4. Evaluate exactly: $\int_0^3 2\sqrt{9 - x^2} \, dx$. Use $x = 3 \sin(\theta)$; $|x| \leq 3$; $-\pi/2 \leq \theta \leq \pi/2$.

Name _____ Score _____ Teacher _____ Date _____

Trigonometric Substitution Integrals

Choose the standard substitution, state its domain, simplify the radical, and back-substitute to x . Give exact values for definite integrals.

5. Evaluate exactly: $\int 3\sqrt{64 + x^2} \, dx$. Use $x = 8 \tan(\theta)$; all real x ; $-\pi/2 < \theta < \pi/2$.

6. Evaluate exactly: $\int_8^{8\sqrt{2}} 3\sqrt{x^2 - 64} \, dx$. Use $x = 8 \sec(\theta)$; $x \geq 8$; $0 \leq \theta < \pi/2$.
