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: integral sqrt(x^2 - 9) dx. Use x = 3 sec(theta); x >= 3; 0 <= theta < pi/2.**

**2.** **Evaluate exactly: integral from 0 to 3 2 sqrt(9 + x^2) dx. Use x = 3 tan(theta); all real x; -pi/2 < theta < pi/2.**

Show the limit, decomposition, identity, or substitution that justifies each result.

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: integral sqrt(16 - x^2) dx. Use x = 4 sin(theta); |x| <= 4; -pi/2 <= theta <= pi/2.**

**4.** **Evaluate exactly: integral from 0 to 3 2 sqrt(9 - x^2) dx. Use x = 3 sin(theta); |x| <= 3; -pi/2 <= theta <= pi/2.**

Show the limit, decomposition, identity, or substitution that justifies each result.

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: integral 3 sqrt(64 + x^2) dx. Use x = 8 tan(theta); all real x; -pi/2 < theta < pi/2.**

**6.** **Evaluate exactly: integral from 8 to 8sqrt(2) 3 sqrt(x^2 - 64) dx. Use x = 8 sec(theta); x >= 8; 0 <= theta < pi/2.**