Evaluate the integral using the indicated trigonometric substitution. Sketch and label the associated right triangle.

1) $\int \frac{1}{x^2\sqrt{x^2-9}}\,dx \qquad x = 3\sec\theta$

2) $\int x^3\sqrt{9-x^2}\,dx \qquad x = 3\sin\theta$

3) $\int \frac{x^3}{\sqrt{x^2+9}}\,dx \qquad x = 3\tan\theta$

4) $\int_0^{2\sqrt{3}} \frac{x^3}{\sqrt{16-x^2}}\,dx$

5) $\int_{\sqrt{2}}^{2} \frac{1}{t^3\sqrt{t^2-1}}\,dt$

6) $\int_0^2 x^3\sqrt{x^2+4}\,dx$

7) $\int \sqrt{1-4x^2}\,dx$

8) $\int \frac{1}{\sqrt{9x^2+6x-8}}\,dx$

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