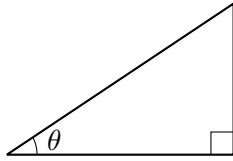
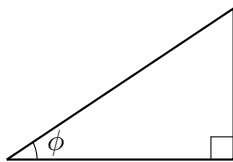


1. (a) Suppose  $\sin \theta = \frac{x}{a}$ . Label the triangle below with  $x$  and  $a$ . Find the length of the remaining side.



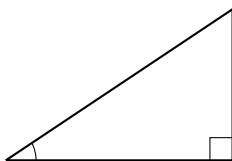
- (b) Evaluate  $\cos \theta$ ,  $\tan \theta$  and  $\sec \theta$  using the triangle from part (a).

2. (a) Suppose  $\sec \phi = \frac{x}{a}$ . Label the triangle below with  $x$  and  $a$ . Find the length of the remaining side.



- (b) Evaluate  $\sin \phi$ ,  $\cos \phi$  and  $\tan \phi$  using the triangle from part (a).

3. Evaluate  $\sin(\arctan(\frac{x}{a}))$ .



4. Determine the appropriate trig substitution for computing the following integrals and draw the associated triangles. You do not need to evaluate the integrals.

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

(b)  $\int \frac{x}{\sqrt{x^2 + 4}} dx$

(c)  $\int \frac{1}{\sqrt{6 - x^2}} dx$

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

(e)  $\int \frac{x^2}{\sqrt{9 + 25x^2}} dx$