



## ICE - Sine and Cosine Derivatives

Calculate formulas for the first derivative of the functions given in the table below.

Function	Derivative
$f(x) = \sin(x)\cos(x)$	
$f(x) = \sin^2(x) + \cos^2(x)$	
$h(t) = \sin(t^2 + 2^t)$	
$l(z) = \frac{\sin(z)}{\cos(z)}$	
$q(s) = e^{\cos(s)}$	
$u(z) = \tan(\cos(z))$	
$v(t) = \cos^2(t) \cdot 4^{\sin(t)}$	
$m(z) = 7\sin(z^2) + \frac{1}{\cos(z)}$	

**Answers:** (a)  $f'(x) = \cos^2(x) - \sin^2(x)$ . (b)  $f'(x) = 0$ . (c)  $h'(t) = (\cos(t^2 + 2^t)) \cdot (2t + \ln(2) \cdot 2^t)$ .  
(d)  $l'(z) = 1/\cos^2(z)$ . (e)  $q'(s) = (-\sin(s)) \cdot e^{\cos(s)}$ . (f)  $u'(z) = -\sin(z)/\cos^2(\cos(z))$ .  
(g)  $v'(t) = -2\cos(t) \cdot \sin(t) \cdot 4^{\sin(t)} + \cos^2(t) \cdot \ln(4) \cdot 4^{\sin(t)} \cdot \cos(t)$ . (h)  $m'(z) = 7\cos(z^2) \cdot 2z + \sin(z)/\cos^2(z)$ .