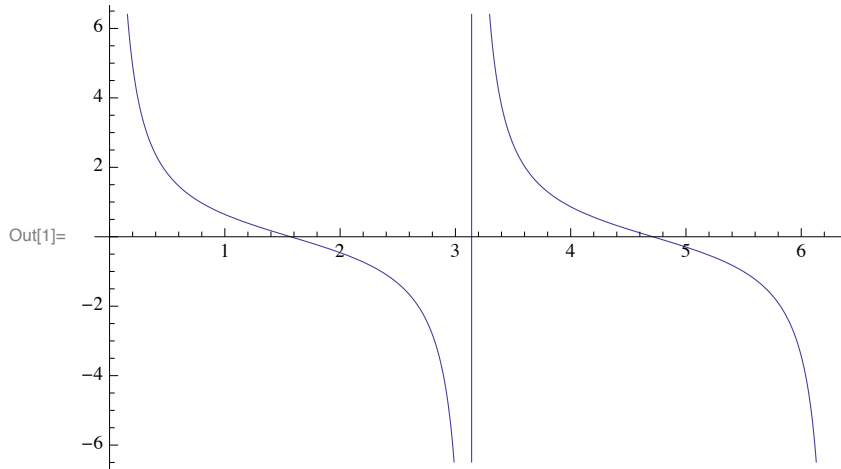


(*AP Calculus BC | Mr. Shubleka | Quiz 2 *)

(* Problem 1 *)

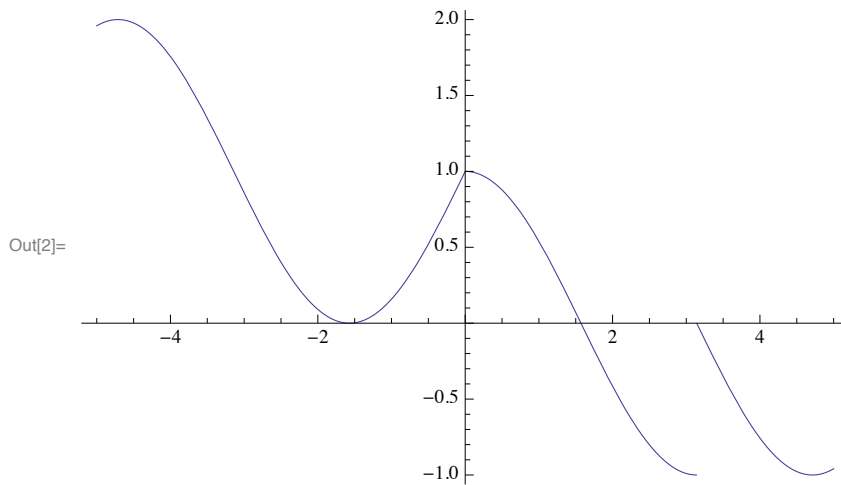
In[1]:= Plot[Cot[x], {x, 0, 2 Pi}]



As x approaches π from the left, $\cos(x)$ approaches -1 , whereas $\sin(x)$ approaches 0 from the right (think: 0.00001). The ratio of these two quantities therefore approaches negative infinity.

(* Problem 2 *)

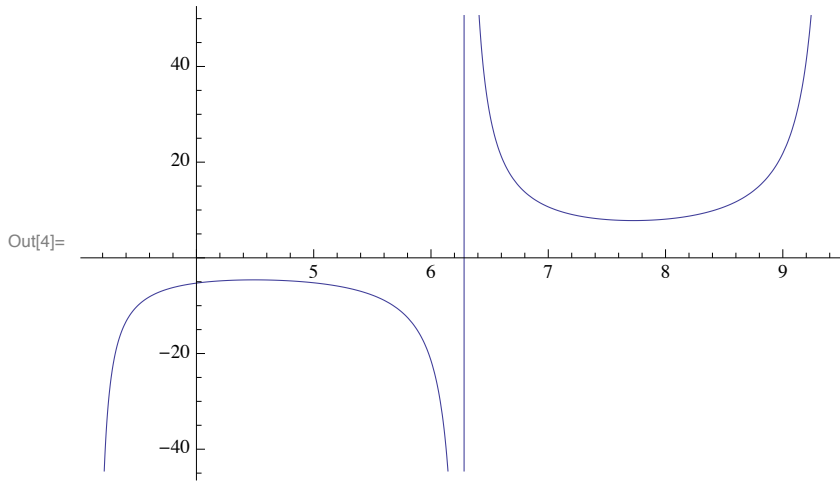
In[2]:= Plot[Piecewise[{{1 + Sin[x], x < 0}, {Cos[x], Pi > x > 0}, {Sin[x], x > Pi}}, {x, -5, 5}]



The limit exists for all real values of $x=a$, except when $a = \pi$. At this point, the one sided limits are different, hence the overall limit doesn't exist.

(* Problem 1 *)

In[4]:= `Plot[x * Csc[x], {x, Pi, 3 Pi}]`



Write the expression as a fraction: $x/\sin(x)$. As x approaches 2π from the left, the denominator ($\sin(x)$) approaches 0 from the negative side (think: -0.00001), whereas the numerator x approaches 2π (a positive finite quantity). The ratio of these two quantities therefore approaches negative infinity.

(* Problem 2 *)

In[3]:= `Plot[Piecewise[{{1 + x, x < -1}, {x^2, 1 > x > -1}, {2 - x, x > 1}}, {x, -5, 5}]`

