Integration Test Functions

Function	Definite integral	Plot
$f_1(x) = e^x$	$I_1 = e - \frac{1}{e}$	y 2.5 2 1.5 1 0.5 0 -1 -0.75-0.5-0.25 0 0.25 0.5 0.75 1
$f_2(x) = \cos(x)$	$I_2 = \sin(1) - \sin(-1)$	y 0.9 0.8 0.7 0.6 -1 -0.75-0.5-0.25 0 0.25 0.5 0.75 1
$f_3(x) = \tan\left(x - \frac{1}{2}\right)$	$I_3(x) = \ln \left \frac{\cos\left(-\frac{3}{2}\right)}{\cos\left(\frac{1}{2}\right)} \right $	y x x -4 -6 -8 -10 -12 -14 -1 -0.75-0.5-0.25 0 0.25 0.5 0.75 1
$f_4(x) = \sqrt{1 - x^2}$	$I_4 = \frac{\pi}{2}$	y 0.8 0.6 0.4 0.2 0 -1 -0.75-0.5-0.25 0 0.25 0.5 0.75 1
$f_5(x) = \begin{cases} \frac{x}{3}, & \text{if } x < 0.1\\ 1, & \text{otherwise} \end{cases}$	$I_5 = 0.9 - 1.1 \cdot \frac{0.9}{6}$	y 1 0.8 0.6 0.4 0.2 0 -0.2 -1 -0.75-0.5-0.25 0 0.25 0.5 0.75 1

$f_6(x) = \begin{cases} f_4(x), & \text{if } x < 0 \\ 1, & \text{otherwise} \end{cases}$	$I_6 = \frac{\pi}{4} + 1$	y 0.8 0.6 0.4 0.2 0 -1 -0.75-0.5-0.25 0 0.25 0.5 0.75 1
$f_7(x) = \frac{1}{\sqrt{x+1}}$	$I_7 = 2 \cdot \sqrt{2}$	y 3 2 1 0 -0.75-0.5-0.25 0 0.25 0.5 0.75 1
$f_8(x) = \tan\left(\frac{\pi}{4}(x+1)\right)$	$I_8 = -\frac{4}{\pi} \ln \left[\cos \left(\frac{\pi}{2} \right) \right]$	y 60 50 40 30 20 10 0 -1 -0.75-0.5-0.25 0 0.25 0.5 0.75 1

 $x \in [-1, 1]$