Arc Length	Area, Surface of Rev	Para-metrics	Polar Coordinates	Random
100 $s= \int \sqrt{1+[f'(x)]^2}\, dx$	**100** $S = 2\pi \int r(x)\sqrt{1+[f'(x)]^2}\, dx$	**100** $L = \int \sqrt{(dx/dt)^2 + (dy/dt)^2}\, dt$	**100** $P(x, y) = P(r\cos\theta , r\sin\theta)$ $P(r, \theta) = P(\sqrt{x^2+y^2}, \arctan(y/x))$	**100** 1621
200 $\int_0^{pi/2} \sqrt{1+81\cos^2(y)}\, dy$	**200** $\int_1^4 2(pi)y\sqrt{1+(5+y^{-2})^2}\, dy$	**200** $S= \int 2\pi x \sqrt{(dx/dt)^2 + (dy/dt)^2}\, dt$	**200** $A= 1/2\int r^2 d\theta$	**200** California
300 $L = \int_0^6 \sqrt{1+x}\, dx$	**300** $\int_0^{\ln(7)} (pi)(1/3e^x-1/3)\sqrt{1+1/36e^{2x}}\, dx$	**300** t=-2 -> (18,1/3) t=0 -> (0,3) t=2 -> (54,27)	**300** r>0 : (8, 9pi/4) r<0 : (-8, 5pi/4)	**300** Abraham Lincoln
400 $(14/3)\sqrt{7} - 2/3$	**400** $S= \int_0^1 2(pi)y\sqrt{1+36/(6y+1)^2}\, dy$	**400** $(dx/dt) = 18t^2+4$ $(dy/dt) = 3-10t$ $(dy/dx) = (3-10t)/(18t^2+4)$	**400** $x^2-y^2=64$	**400** Orlando, FL
500 $2/3(5\sqrt{5} - 1)$		**500** $24(pi)((4(\sqrt{2})/5 + 4/5)$	**500** $r=-4\sec\theta$	**500** Fires