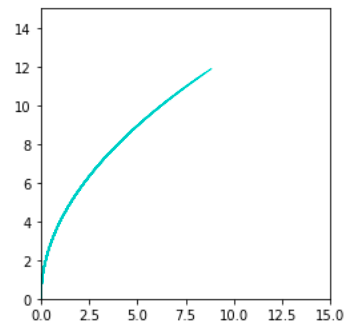
**BHASWANTH AYAPILLA**

**2020AAPS0304H**

1a)

Parabolic curve:



**Linear velocities vx,vy:** [[0.0, 24], [0.7272727272727273, 24], [1.4545454545454546, 24], [2.1818181818181817, 24], [2.909090909090909, 24], [3.6363636363636367, 24], [4.363636363636363, 24], [5.090909090909092, 24], [5.818181818181818, 24], [6.545454545454546, 24], [7.272727272727273, 24], [8.0, 24], [8.727272727272727, 24], [9.454545454545455, 24], [10.181818181818183, 24], [10.90909090909091, 24], [11.636363636363637, 24], [12.363636363636365, 24], [13.090909090909092, 24], [13.81818181818182, 24], [14.545454545454547, 24], [15.272727272727273, 24], [16.0, 24], [16.72727272727273, 24], [17.454545454545453, 24], [18.181818181818183, 24], [18.90909090909091, 24], [19.63636363636364, 24], [20.363636363636367, 24], [21.09090909090909, 24], [21.81818181818182, 24], [22.545454545454547, 24], [23.272727272727273, 24], [24.000000000000004, 24], [24.72727272727273, 24], [25.45454545454546, 24], [26.181818181818183, 24], [26.90909090909091, 24], [27.63636363636364, 24], [28.363636363636367, 24], [29.090909090909093, 24], [29.818181818181824, 24], [30.545454545454547, 24], [31.272727272727273, 24], [32.0, 24], [32.727272727272734, 24], [33.45454545454546, 24], [34.18181818181819, 24], [34.90909090909091, 24], [35.63636363636364, 24], [0.0, 24], [0.7272727272727273, 24], [1.4545454545454546, 24], [2.1818181818181817, 24], [2.909090909090909, 24], [3.6363636363636367, 24], [4.363636363636363, 24], [5.090909090909092, 24], [5.818181818181818, 24], [6.545454545454546, 24], [7.272727272727273, 24], [8.0, 24], [8.727272727272727, 24], [9.454545454545455, 24], [10.181818181818183, 24], [10.90909090909091, 24], [11.636363636363637, 24], [12.363636363636365, 24], [13.090909090909092, 24], [13.81818181818182, 24], [14.545454545454547, 24], [15.272727272727273, 24], [16.0, 24], [16.72727272727273, 24], [17.454545454545453, 24], [18.181818181818183, 24], [18.90909090909091, 24], [19.63636363636364, 24], [20.363636363636367, 24], [21.09090909090909, 24], [21.81818181818182, 24], [22.545454545454547, 24], [23.272727272727273, 24], [24.000000000000004, 24], [24.72727272727273, 24], [25.45454545454546, 24], [26.181818181818183, 24], [26.90909090909091, 24], [27.63636363636364, 24], [28.363636363636367, 24], [29.090909090909093, 24], [29.818181818181824, 24], [30.545454545454547, 24], [31.272727272727273, 24], [32.0, 24], [32.727272727272734, 24], [33.45454545454546, 24], [34.18181818181819, 24], [34.90909090909091, 24], [35.63636363636364, 24]]

**Angular velocity:** [-3.0, -2.9972477064220184, -2.989021043000915, -2.9754098360655736, -2.9565610859728504, -2.9326750448833034, -2.9040000000000004, -2.8708260105448153, -2.8334778837814394, -2.792307692307692, -2.747687132043734, -2.6999999999999997, -2.6496350364963503, -2.59697933227345, -2.542412451361867, -2.4863013698630136, -2.428996282527881, -2.3708272859216253, -2.3121019108280256, -2.253103448275862, -2.194089993284083, -2.135294117647059, -2.076923076923077, -2.0191594561186648, -1.962162162162162, -1.9060676779463244, -1.8509915014164304, -1.7970297029702968, -1.7442605445808859, -1.6927461139896371, -1.6425339366515839, -1.5936585365853657, -1.546142924751538, -1.5, -1.4552338530066813, -1.4118409680207433, -1.369811320754717, -1.3291293734743694, -1.2897749703908408, -1.2517241379310342, -1.2149497954629973, -1.17942238267148, -1.1451104100946372, -1.1119809394145674, -1.08, -1.0491329479768785, -1.0193447737909516, -0.9906003638568829, -0.9628647214854111, -0.9361031518624641, -3.0, -2.9972477064220184, -2.989021043000915, -2.9754098360655736, -2.9565610859728504, -2.9326750448833034, -2.9040000000000004, -2.8708260105448153, -2.8334778837814394, -2.792307692307692, -2.747687132043734, -2.6999999999999997, -2.6496350364963503, -2.59697933227345, -2.542412451361867, -2.4863013698630136, -2.428996282527881, -2.3708272859216253, -2.3121019108280256, -2.253103448275862, -2.194089993284083, -2.135294117647059, -2.076923076923077, -2.0191594561186648, -1.962162162162162, -1.9060676779463244, -1.8509915014164304, -1.7970297029702968, -1.7442605445808859, -1.6927461139896371, -1.6425339366515839, -1.5936585365853657, -1.546142924751538, -1.5, -1.4552338530066813, -1.4118409680207433, -1.369811320754717, -1.3291293734743694, -1.2897749703908408, -1.2517241379310342, -1.2149497954629973, -1.17942238267148, -1.1451104100946372, -1.1119809394145674, -1.08, -1.0491329479768785, -1.0193447737909516, -0.9906003638568829, -0.9628647214854111, -0.9361031518624641]

Plot of all the above points along the parabolic trajectory:

Cyan - linear velocity along x

Green - linear velocity along y

Red - angular velocity

