```
DSolve[y[x] (1 + (y'[x])^2) == d, y[x], x]
```

$$\left\{\left\{y[x] \to \text{InverseFunction}\left[d \text{ArcTan}\left[\frac{\sqrt{\#1}}{\sqrt{d-\#1}}\right] - \sqrt{d-\#1}\ \sqrt{\#1}\ \&\right][-x + C[1]]\right\},\right.$$

$$\left.\left\{y[x] \to \text{InverseFunction}\left[d \text{ArcTan}\left[\frac{\sqrt{\#1}}{\sqrt{d-\#1}}\right] - \sqrt{d-\#1}\ \sqrt{\#1}\ \&\right][x + C[1]]\right\}\right\}$$

```
Integrate[Sqrt[y/(d - y)], dy] // FullSimplify
```

$$\frac{\sqrt{\frac{y}{d-y}}\ \left(\sqrt{y}\ (-d+y) + d\sqrt{d-y}\ \text{ArcTan}\left[\frac{\sqrt{y}}{\sqrt{d-y}}\right]\right)}{\sqrt{y}}$$

```
ParametricPlot[{t - Sin[t], Cos[t] - 1}, {t, 0, π},
 PlotStyle → {Red, Thick}]
```