

Homework 27. *Chapter 9.*

- 2.1 $\sqrt{xy}'/\sqrt{1+y'^2} = c$. Solution is $(y/2c)^2 = x - c^2$ (a parabola).
2.2 $(d/dx)(y'/x\sqrt{1+y'^2}) = 0$. Solution $x^2 + y^2 = c$ (a circle centered at 0).
2.3 $(d/dx)(-xy'/\sqrt{1-y'^2}) = 0$. $x = \sinh(ay + b)/a$
2.4 $(d/dx)(xy'/\sqrt{1+y'^2}) = 0$. $x = c \cosh(y/c)$.
3.1 First integral: $dx/dy = C/\sqrt{y^3 - c^2}$
3.2 $(d/dy)(\sqrt{1+x'^{-2}}/y^2 - 1/x'y^2\sqrt{1+x'^2}) = 0$.
3.5 $(d/dy)(x'/\sqrt{x'^2 + y^2}) = 0$. Solution is $x = ay^2 + b$.
3.6 $(d/dy)(-y/(x' + y)^2) = 0$. Solution $x = ay^{3/2} - y^2/2 + b$