



1. [2]  $\frac{dy}{dx} = \frac{3y^2-6x}{-6xy+8y}$  (implicit differentiation)

2.

(a) [1] (v)  $\frac{dy}{dt}$

(b) [1] (ii) 9; since  $\frac{dA}{dt} = \frac{1}{2} \left( x \frac{dy}{dt} + y \frac{dx}{dt} \right)$

(c) [1] (v)  $\frac{18}{\sqrt{18}}$ ; since  $\frac{dr}{dt} = \frac{1}{r} \left( x \frac{dy}{dt} + y \frac{dx}{dt} \right)$

(d) [1] (i) 10.24; since  $\frac{dP}{dt} = \frac{dx}{dt} + \frac{dy}{dt} + \frac{dz}{dt}$