PS7: Implicit differentiation – Quick reference key

1. (Activity 2.7.2)

   (a) (anything reasonable)

   (b) $\dfrac{dy}{dx} = \dfrac{1}{5y^4 - 15y^2 + 4}$

   (c) $\dfrac{dy}{dx} = -\dfrac{1}{6}$, so $L(x) = -\dfrac{1}{6}(x-0)+1$

   (d) $y = \pm 1.418697$ and $y = \pm 3.63143$

2. (Activity 2.7.4)

   (a) $\dfrac{dy}{dx} = \dfrac{6y-3x^2}{-3y^2-6x}$; slope 1; tangent line $y-3 = 1(x+3)$

   (b) $\dfrac{dy}{dx} = \dfrac{3x^2+1}{\cos(y)+1}$; slope 1/2; tangent line $y-0 = \dfrac{1}{2}(x-0)$

   (c) $\dfrac{dy}{dx} = \dfrac{3e^{-xy} - 3xye^{-xy}}{3x^2e^{-xy}+2y}$; slope 0.234950; tangent line $y-1 = 0.234950(x-0.619061)$.