***Solution*** ***Section* 2.7 – Implicit Differentiation**

***Exercise***

Find  

***Solution***













***Exercise***

Find  

***Solution***









***Exercise***

Find  

***Solution***















 ***Divide every term by* 2**



***Exercise***

Find  

***Solution***









***Exercise***

Find  

***Solution***









***Exercise***

Find  

***Solution***









***Exercise***

Find  

***Solution***



 ***Divide by* 6 *both sides***











***Exercise***

Find  

***Solution***













***Exercise***

Find  

***Solution***













***Exercise***

Find  

***Solution***











***Exercise***

Find  

***Solution***









***Exercise***

Find  

***Solution***









***Exercise***

Find  

***Solution***

 









***Exercise***

Find  

***Solution***







***Exercise***

Find  

***Solution***







***Exercise***

Find  

***Solution***

 ***Multiply all terms by*** 



















***Exercise***

Find  

***Solution***



























***Exercise***

If , find the value of  at the point (2, 2).

***Solution***

























***Exercise***

Find :  and evaluate the derivative at the given point 

***Solution***















***Exercise***

Find the slope of the curve  at the point (−2, 1) and (−2, −1)

***Solution***

1 and −1

***Exercise***

Find the slope of the tangent line to the circle  at the point (5, 1)

***Solution***











***Exercise***

Find the slope of the tangent line to the circle  at the point (3, −4)

***Solution***









Slope: 



***Exercise***

Find an equation of the line tangent to the following curves at the given point



***Solution***





 

***Exercise***

Find an equation of the line tangent to the following curves at the given point



***Solution***









 



***Exercise***

Find an equation of the line tangent to the following curves at the given point



***Solution***











 



***Exercise***

Find an equation of the line tangent to the following curves at the given point



***Solution***







 



***Exercise***

Find the equation of the tangent line to the circle  at the point (2, 4)

***Solution***

















 





***Exercise***

Find the lines that are (***a***) tangent and (***b***) normal to the curve  at the point (2, 3).

***Solution***







1. 





 





1. 

 





***Exercise***

Find the lines that are (***a***) tangent and (***b***) normal to the curve  at the point (−1, 0).

***Solution***







1. 





 



1. 

 

***Exercise***

Find the lines that are (***a***) tangent and (***b***) normal to the curve  at the point (0, π).

***Solution***







1. 









1. 



***Exercise***

Suppose that *x* and *y* are both functions of *t*, which can be considered to represent time, and that *x* and *y* are related by the equation 

Suppose further that when *x* = 2 and *y* = 3, then . Find the value of the  at that moment.

***Solution***













***Exercise***

A cone-shaped icicle is dripping from the roof. The radius of the icicle is decreasing at a rate of 0.2 *cm* per hour, while the length is increasing at a rate of 0.8 *cm* per *hour*. If the icicle is currently 4 *cm* in radius and 20 *cm* long, is the volume of the icicle increasing or decreasing and at what rate?

***Solution***

The volume of the cone is given by the formula: .



***Given*** the values:







The volume is decreasing at a rate of 20 *cm*3 per *hour*.