**The Inverse hyperbolic function** If is  any differentiable function of  then:

1. 
2. 
3. 
4. 
5. 
6. 

**EXAMPLE 1:** Find for the following function.

1. 

Sol:

 

 

1. 

Sol:

 

1. 

Sol:



1. 

Sol:

 

**EXAMPLE 2:** Verify the following formulas:

1. 

Sol:

 Let 













1. 

Sol:

Let 













**مراجعة**

**((اسئلة اضافية))**

**EXAMPLE 1:** Find  for the following function.

1. 

Sol:

 

1. 

Sol:

 

1. 

Sol:

 

1. 

Sol:

 

**EXAMPLE 2:** Find the value of the derivative.

1.  if 

Sol:

  

1.   

Sol:

 

  

1.  if  

Sol:

 

 

**EXAMPLE 3:** Find the derivative of 

Sol:

 



**EXAMPLE 4:** Find an equation for the tangent to the curve  at the point 

Sol:

 

The slope at 







The line through with slope 







**EXAMPLE 5:** Find higher derivatives 

Sol:

 First 

Second 

Third 

Fourth 

**EXAMPLE 6:** Find  for the following Trigonometric function.

1. 

Sol:

 

1. 

Sol:

 

1. 

Sol:

 

 

1. 

Sol:

 

 

 

1. If  find 

Sol:

 

 



1. Find the slope of the line tangent to the curve  at point where 

Sol:

 

 

1. If and  Find the value of  at 

Sol:

**Hint:** Note that we are also able to find as a function of 

 







 