***Chapter 1***

***Section* 1.1 – Differential Equation Models**

***Exercise***

The rate of growth of bacteria in a petri dish is proportional to the number of bacteria in the dish.

***Exercise***

The rate of growth of a population of field mice is inversely proportional to the square root of the population.

***Solution Section* 1.2 – Derivative**

***Exercise***

*Find the derivative to the following functions* 

***Solution***





***Exercise***

*Find the derivative to the following functions* 

***Solution***





***Exercise***

*Find the derivative to the following functions* 

***Solution***





***Exercise***

*Find the derivative to the following functions* 

***Solution***





***Exercise***

*Find the derivative to the following functions* 

***Solution***







***Exercise***

*Find the derivative to the following functions* 

***Solution***



























***Exercise***

*Find the derivative to the following functions* 

***Solution***









***Exercise***

*Find the derivative to the following functions* 

***Solution***







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*Find the derivative to the following functions* 

***Solution***









***Exercise***

*Find the derivative to the following functions* 

***Solution***





















***Exercise***

Find the derivative to the following functions

***Solution***











***Exercise***

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***Exercise***

*Find the derivative to the following functions* 

***Solution***



***Exercise***

*Find the derivative to the following functions* 

***Solution***







***Exercise***

*Find the derivative to the following functions* 

***Solution***









***Exercise***

Find the derivative to the following functions 

***Solution***









***Exercise***

Find the derivative to the following functions

***Solution***







***Exercise***

Find the derivative to the following functions

***Solution***











***Exercise***

Find the derivative to the following functions

***Solution***





***Exercise***

Find the derivative to the following functions******

***Solution***











***Exercise***

Find the derivative to the following functions

***Solution***











***Exercise***

Find the derivative to the following functions

***Solution***

 *Product Property*



 *Power Property*

 *Differentiate*



***Exercise***

Find the derivative to the following functions

***Solution***







***Exercise***

Find the derivative to the following functions

***Solution***











***Exercise***

Find the derivative to the following functions

***Solution***





***Exercise***

Find the derivative to the following functions

***Solution***







***Solution Section* 1.3 – Integration**

***Exercise***

Find each indefinite integral. 

***Solution***











***Exercise***

Find the general solution of the differential equation: 

***Solution***













***Exercise***

Find the general solution of the differential equation: 

***Solution***









 Substitute for *x* and *dx*









***Exercise***

Find the general solution of the differential equation: 

***Solution***















***Exercise***

A ball is thrown into the air from an initial height of 6 m with an initial velocity of 120 m/s. What will be the maximum height of the ball and at what time will this event occur?

***Solution***























 





***Exercise***

Find the general solution of the differential equation: 

***Solution***











***Exercise***

Derive the position function if a ball is thrown upward with initial velocity of 32 ft per second from an initial height of 48 ft. When does the ball hit the ground? With what velocity does the ball hit the ground?

***Solution***























 







The ball hits the ground in 3 seconds

The velocity: 



***Exercise***

Find the general solution of , and find the particular solution that satisfies the initial condition *F*(1) = 8.

***Solution***













