|  |  |
| --- | --- |
| **1.** | Complete the table of values (to five decimal places) and use the table to estimate the value of .    Answer: It appears that . |
|  |

|  |  |
| --- | --- |
| **2.** | Complete the table of values (to five decimal places) and use the table to estimate the value of .    Answer: It appears that . |
|  |

|  |  |  |
| --- | --- | --- |
| **3.** | Complete the table of values (to five decimal places) and use the table to estimate the value of .    Answer: It appears that . | |
|  |
| **4.** | Use a table of values to estimate the value of . Use a graphing device to confirm your answer.  Answer: | |
|  |
| **5.** | Use a table of values to estimate the value of . Use a graphing device to confirm your answer graphically.  Answer: It appears that. |
|  |

|  |  |
| --- | --- |
| **6.** | Use a table of values to estimate the value of . Use a graphing device to confirm your answer graphically.  Answer: It appears that . |
|  |

|  |  |
| --- | --- |
| **7.** | For the functionwhose graph is given, state the value of the given quantity.  (a)  (b)  (c)  (d)    Answer: (a) , (b) , (c)  does not exist, (d) |
|  |

|  |  |
| --- | --- |
| **8.** | For the functionwhose graph is given, state the value of the given quantity.  C:\Users\user\Desktop\2010-10-03_191244.png(a)  (b)  (c)  (d)  (e)  (f)  (g)  Answer: (a)  (b)  (c)  (d) , (e)  (f)  (g)  is not defined. |
|  |

|  |  |
| --- | --- |
| **9.** | For the function *g* whose graph is given, state the value of the given quantity if it exists.  C:\Users\user\Desktop\2010-10-03_115838.png        Answer: a)  b)  c) DNE |
|  |

|  |  |
| --- | --- |
| **10.** | For the function *g* whose graph is given, state the value of the given quantity if it exists.  C:\Users\user\Desktop\2010-10-03_115838.png        Answer: a)  b)  c) DNE |
|  |

|  |  |
| --- | --- |
| **11.** | For the function *g* whose graph is given, state the value of the given quantity if it exists.  C:\Users\user\Desktop\2010-10-03_115838.png       Answer: a) DNE b) |
|  |

|  |  |
| --- | --- |
| **12.** | For the function *g* whose graph is given, state the value of the given quantity if it exists.  C:\Users\user\Desktop\2010-10-03_115838.png       Answer: a) DNE b) |
|  |

|  |  |
| --- | --- |
| **13.** | Use a graphing device to determine whether  exists. If the limit exists, estimate its value to two decimal places.  Answer: |
|  |

|  |  |
| --- | --- |
| **14.** | Use a graphing device to determine whether  exists. If the limit exists, estimate its value to two decimal places.  Answer: |
|  |

|  |  |
| --- | --- |
| **15.** | Use a graphing device to determine whether  exists. If the limit exists, estimate its value to two decimal places.  Answer:  does not exist. |
|  |

|  |  |
| --- | --- |
| **16.** | Graph . Use your graph to find (a), (b), (c)  Answer:  (a) , (b) , (c) |
|  |

|  |  |
| --- | --- |
| **17.** | Graph.  Use your graph to find (a) , (b) , (c)  Answer:    (a)  , (b)  , (c)  does not exist |
|  |

|  |  |
| --- | --- |
| **18.** | Graph the piecewise function .  Use your graph to find (a), (b), (c)  Answer: (a)  , (b)  (c) |
|  |

|  |  |
| --- | --- |
| **1.** | Evaluate , and justify each step by indicating the appropriate Limit Law(s).  Answer: |
|  |

|  |  |
| --- | --- |
| **2.** | Evaluate , and justify each step by indicating the appropriate Limit Law(s).  Answer: |
|  |

|  |  |
| --- | --- |
| **3.** | Evaluate , and justify each step by indicating the appropriate Limit Law(s).  Answer: |
|  |

|  |  |
| --- | --- |
| **4.** | Evaluate .  Answer: |
|  |

|  |  |
| --- | --- |
| **5.** | Evaluate.  Answer: |
|  |

|  |  |
| --- | --- |
| **6.** | Evaluate .  Answer: |
|  |

|  |  |
| --- | --- |
| **7.** | Evaluate .  Answer: |
|  |

|  |  |
| --- | --- |
| **8.** | Evaluate .  Answer: |
|  |

|  |  |
| --- | --- |
| **9.** | Evaluate .  Answer: |
|  |

|  |  |
| --- | --- |
| **10.** | Evaluate the limit if it exists.    Answer: |
|  |

|  |  |
| --- | --- |
| **11.** | Evaluate the limit if it exists.    Answer: |
|  |

|  |  |
| --- | --- |
| **12.** | Evaluate the limit if it exists.    Answer: |
|  |

|  |  |
| --- | --- |
| **13.** | Evaluate the limit if it exists.    Answer: |
|  |

|  |  |
| --- | --- |
| **14.** | Evaluate . |
|  |

|  |  |
| --- | --- |
| **15.** | Find the limit .  Answer: |
|  |

|  |  |
| --- | --- |
| **16.** | Find . Use a graphing device to confirm your result graphically.  Answer: |
|  |

|  |  |
| --- | --- |
| **17.** | Find . Use a graphing device to confirm your result graphically. |
|  |

|  |  |
| --- | --- |
| **18.** | Let .  (a) Use the graph of  to estimate the value of  to two decimal places.  (b) Use a table of values of  to estimate the limit to four decimal places.  (c) Use the Limit Laws to find the exact value of .  Answer:(a) ; (b)  (c) |
|  |

|  |  |
| --- | --- |
| **19.** | Find the value of , if it exists. If the limit does not exist, explain why.  Answer: does not exist because . |
|  |

|  |  |
| --- | --- |
| **20.** | Find the value of , if it exists. If the limit does not exist, explain why.  Answer: |
|  |

|  |  |
| --- | --- |
| **21.** | Find the value of , if it exists. If the limit does not exist, explain why.  Answer:. Notice that  and |
|  |

|  |  |
| --- | --- |
| **1.** | Find the slope of the tangent line of the graph of  at the point .  Answer: |
|  |

|  |  |
| --- | --- |
| **2.** | Find the slope of the tangent line of the graph of  at the point .  Answer: |
|  |

|  |  |
| --- | --- |
| **3.** | Find the slope of the tangent line of the graph of  at the point .  Answer: .  Equation of the line:. |
|  |

|  |  |
| --- | --- |
| **4.** | Find the equation of the tangent line to the curve  at the point .  Answer:  Equation of the line:. |
|  |

|  |  |
| --- | --- |
| **5.** | Find the equation of the tangent line to the curve at the point .  Answer: .  Equation of the line: |
|  |

|  |  |
| --- | --- |
| **6.** | Find the equation of the tangent line to the curve  at the point .  Answer: .  Equation of the line: |
|  |

|  |  |
| --- | --- |
| **7.** | Find the derivative of  at the point .  Answer: |
|  |

|  |  |
| --- | --- |
| **8.** | Find the derivative of  at the point .  Answer: |
|  |

|  |  |
| --- | --- |
| **9.** | Find the derivative of  at the point .  Answer: |
|  |

|  |  |
| --- | --- |
| **10.** | Find the derivative of the function at the given number.  at 2  Answer: |
|  |

|  |  |
| --- | --- |
| **11.** | Find the derivative of the function at the given number.  at 2  Answer: |
|  |

|  |  |
| --- | --- |
| **12.** | Find the derivative of the function at the given number.  at 1  Answer: |
|  |

|  |  |
| --- | --- |
| **13.** | Find the derivative of the function at the given number.  at 1  Answer: |
|  |

|  |  |
| --- | --- |
| **14.** | Find the derivative of the function at the given number.  at 4  Answer: |
|  |

|  |  |
| --- | --- |
| **15.** | Find the derivative of the function at the given number.  at 4  Answer: |
|  |

|  |  |
| --- | --- |
| **16.** | Find , where *a* is in the domain of *f*.    Answer: |
|  |

|  |  |
| --- | --- |
| **17.** | Find , where *a* is in the domain of *f*.    Answer: |
|  |

|  |  |
| --- | --- |
| **18.** | If , find .  Answer: |
|  |

|  |  |
| --- | --- |
| **19.** | If  , find  .  Answer: |
|  |

|  |  |
| --- | --- |
| **20.** | A rocket is fired directly upward from the ground with a velocity of ft/s. Its height after  seconds is given by .  (a) Find the velocity of the rocket when s.  (b) Find its velocity when s.    (b) |
|  |

|  |  |
| --- | --- |
| **21.** | A particle moves in a straight line with its displacement of motion described by equation , where  is measured in feet and  is measured in seconds. Find the velocity of  at , , , and .  Answer: Velocity of  at  is  so , , and . |
|  |

|  |  |
| --- | --- |
| **22.** | A stone is dropped into a pond causing a circular ripple in the water. Find the rate of change of the area  of the circle with respect to the radius when ft.  Answer:   ft/s |

|  |  |
| --- | --- |
| **23.** | An object is dropped from a height of ft. Its distance above the ground after  seconds is given by . Find the object's velocity at s.  Answer:  ft/s |

|  |  |
| --- | --- |
| **1.** | Find .  Answer: |
|  |

|  |  |
| --- | --- |
| **2.** | Find .  Answer: |
|  |

|  |  |
| --- | --- |
| **3.** | Find .  Answer: |
|  |

|  |  |
| --- | --- |
| **4.** | Find .  Answer: |
|  |

|  |  |
| --- | --- |
| **5.** | Find .  Answer: |
|  |

|  |  |
| --- | --- |
| **6.** | Find .  Answer: |
|  |

|  |  |
| --- | --- |
| **7.** | Find .  Answer: |
|  |

|  |  |
| --- | --- |
| **8.** | Find .  Answer: |
|  |

|  |  |
| --- | --- |
| **9.** | Use a table of values to estimate the value of . Then use a graphing device to confirm your result graphically.  Answer: |
|  |

|  |  |
| --- | --- |
| **10.** | Use a table of values to estimate the value of . Then use a graphing device to confirm your result graphically.  Answer: Let . |
|  |

|  |  |
| --- | --- |
| **11.** | Use a table of values to estimate the value of . Then use a graphing device to confirm your result graphically.  Answer: Let . |
|  |

|  |  |
| --- | --- |
| **12.** | Use a table of values to estimate the value of . Then use a graphing device to confirm your result graphically.  Answer: Let.  We estimate that . |
|  |

|  |  |
| --- | --- |
| **13.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Converges; |
|  |

|  |  |
| --- | --- |
| **14.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Diverges |
|  |

|  |  |
| --- | --- |
| **15.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Converges; |
|  |

|  |  |
| --- | --- |
| **16.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Converges; |
|  |

|  |  |
| --- | --- |
| **17.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Converges; |
|  |

|  |  |
| --- | --- |
| **18.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Diverges |
|  |

|  |  |
| --- | --- |
| **19.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Converges; |
|  |

|  |  |
| --- | --- |
| **20.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Diverges |
|  |

|  |  |
| --- | --- |
| **21.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Converges; |
|  |

|  |  |
| --- | --- |
| **22.** | Determine whether the sequence  converges or diverges. If it converges, find the limit.  Answer: Converges; |
|  |

|  |  |
| --- | --- |
| **1.** | Estimate the area under the graph of  from  to  using (a) four approximating rectangles and right endpoints. (b) four approximating rectangles and left endpoints. (c) eight approximating rectangles and right endpoints.  Answer:(a) The rectangles have width  and heights of , , , and , so . (b) The rectangles have width  and heights of ,,, and , so . (c) |
|  |

|  |  |
| --- | --- |
| **2.** | Estimate the area under the graph of  from  to  using (a) four approximating rectangles and right endpoints. (b) four approximating rectangles and left endpoints. (c) eight approximating rectangles and right endpoints.  Answer:(a) The rectangles have width  and heights of , ,, and , so .  (b) The rectangles have width  and heights of ,,,, so  .  (c) |
|  |

|  |  |
| --- | --- |
| **3.** | Estimate the area under the graph of  from  to  using (a) four approximating rectangles and right endpoints. (b) four approximating rectangles and left endpoints. (c) eight approximating rectangles and right endpoints.  Answer:(a) The rectangles have width  and heights of , , , and , so  (b) The rectangles have width  and heights of , ,, and , so  (c) |
|  |

|  |  |
| --- | --- |
| **4.** | Use the definition of area as a limit to find the area of the region that lies under the graph of  over the interval .  Answer: Width: , Right endpoint: , Height: . |
|  |

|  |  |
| --- | --- |
| **5.** | Use the definition of area as a limit to find the area of the region that lies under the graph of  over the interval .  Answer: Width: , REP: , Height:. |
|  |

|  |  |
| --- | --- |
| **6.** | Use the definition of area as a limit to find the area of the region that lies under the graph of  over the interval .  Answer: Width:  , REP: , Height: . |

|  |  |
| --- | --- |
| **7.** | Use the definition of area as a limit to find the area of the region that lies under the graph of  over the interval .  Answer: Width:  , REP: , Height: . |

|  |  |
| --- | --- |
| **8.** | Use the definition of area as a limit to find the area of the region that lies under the graph of  over the interval .  Answer: Width: , REP: , Height:  . |

|  |  |
| --- | --- |
| **9.** | Use the definition of area as a limit to find the area of the region that lies under the graph of  over the interval  .  Answer: Width:  , Right EP: , Height: . |

|  |  |
| --- | --- |
| **10.** | Use the definition of area as a limit to find the area of the region that lies under the graph of  over the interval .  Answer: Width:  , Right endpoint:  , Height:  . |