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| 1. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.​Find the distance traveled in 13 seconds by an object traveling at a constant velocity of 15 feet per second.​

|  |  |  |
| --- | --- | --- |
|   | a.  | calculus, 195 ft |
|   | b.  | calculus, 215 ft |
|   | c.  | precalculus, 195 ft |
|   | d.  | calculus, 390 ft |
|   | e.  | precalculus, 390 ft |

|  |  |
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| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.1.2 - Understand that the tangent line problem is basic to calculus. |
| *OTHER:* | Skill |
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| 2. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.​Find the distance traveled in 19 seconds by an object moving with a velocity of feet per second. Round your answer to four decimal places.​

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| --- | --- | --- |
|   | a.  | calculus, 215.9209 ft |
|   | b.  | precalculus, 217.2709 ft |
|   | c.  | calculus, 210.0491 ft |
|   | d.  | precalculus, 210.0491 ft |
|   | e.  | precalculus, 215.9209 ft |

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| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC052 - Recognize problems requiring calculus and estimate solutions |
| *OTHER:* | Skill |
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| 3. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.​A cyclist is riding on a path whose elevation is modeled by the function where *x* and are measured in miles. Find the rate of change of elevation when .​​

|  |  |  |
| --- | --- | --- |
|   | a.  | precalculus, 0.09 |
|   | b.  | calculus, 0.21 |
|   | c.  | calculus, 0.81 |
|   | d.  | calculus, 0.09 |
|   | e.  | precalculus, 0.21 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC052 - Recognize problems requiring calculus and estimate solutions |
| *OTHER:* | Skill |
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| 4. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.​A cyclist is riding on a path whose elevation is modeled by the function  where *x* and  are measured in miles. Find the rate of change of elevation when . Round your answer to two decimal places, if necessary. ​​

|  |  |  |
| --- | --- | --- |
|   | a.  | calculus, 0.98 |
|   | b.  | precalculus, 0.14 |
|   | c.  | calculus, 0.14 |
|   | d.  | precalculus, 0.98 |
|   | e.  | precalculus, 0.39 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.1.2 - Understand that the tangent line problem is basic to calculus. |
| *OTHER:* | Skill |
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| 5. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.​Find the area of the shaded region bounded by the triangle with vertices , , .​​​

|  |  |  |
| --- | --- | --- |
|   | a.  | precalculus, 28 |
|   | b.  | calculus, 42 |
|   | c.  | precalculus, 14 |
|   | d.  | precalculus, 42 |
|   | e.  | calculus, 28 |

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| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.1.2 - Understand that the tangent line problem is basic to calculus. |
| *OTHER:* | Skill |
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| 6. Decide whether the following problem can be solved using precalculus, or whether calculus is required. If the problem can be solved using precalculus, solve it. If the problem seems to require calculus, use a graphical or numerical approach to estimate the solution.​Find the area of the shaded region. Round your answer to the whole number.​​

|  |  |  |
| --- | --- | --- |
|   | a.  | calculus , 11 |
|   | b.  | precalculus , 11 |
|   | c.  | precalculus , 13 |
|   | d.  | calculus , 16 |
|   | e.  | precalculus , 16 |

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| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC053 - Recognize problems requiring calculus and estimate solution |
| *OTHER:* | Skill |
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| 7. Consider the function  and the point  on the graph of *f*. Graph *f* and the secant line passing through  and  for .​

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | a.  | ​ | b.  | ​ |
|   | c.  | ​ | d.  | ​ |
|   | e.  | ​ |  |  |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.1.0 - A Preview of Calculus |
| *OTHER:* | Skill |
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| 8. Consider the function  and the point  on the graph of *f*. Find the slope of the secant line passing through  and  for . Round your answer to four decimal places.​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  | **​** |
|   | c.  |  |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC055 - Calculate the slope of a secant line passing through given points |
| *OTHER:* | Skill |
| *DATE CREATED:* | 1/11/2017 9:56 AM |
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| 9. Consider the function  and the point on the graph of *f*.​Consider the secant lines passing through  and  for *x* values of 97, 99, and 101. Find the slope of each secant line to four decimal places. Round your answers to four decimal places, if necessary.​(Think about how you could use your results to estimate the slope of the tangent line of *f* at , and how to improve your approximation of the slope.)​

|  |  |  |
| --- | --- | --- |
|   | a.  | 0.0504 , 0.0501 , 0.025 |
|   | b.  | 0.0504 , –0.0501 , 0.0499 |
|   | c.  | 0.0252 , 0.0251 , 0.025 |
|   | d.  | 0.0504 , 0.0501 , 0.0499 |
|   | e.  | –0.0252 , –0.0251 , –0.025 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC056 - Calculate the slopes of secant lines |
| *OTHER:* | Skill |
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| 10. Consider the function  and the point on the graph of *f*. Estimate the slope *m* of the tangent line of *f* at . Round your answer to four decimal places.​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC057 - Estimate the slope of a tangent line |
| *OTHER:* | Skill |
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| 11. Consider the function  and the point on the graph of *f*. Graph *f* and the secant line passing through  and  for .​

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | a.  | ​ | b.  | ​ |
|   | c.  | ​ | d.  | ​ |
|   | e.  | ​ |  |  |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.1.0 - A Preview of Calculus |
| *OTHER:* | Skill |
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| 12. Consider the function  and the point on the graph of *f*. Find the slope of the secant line passing through  and  for . Round your answer to one decimal place.​

|  |  |  |
| --- | --- | --- |
|   | a.  | 7.5 |
|   | b.  | 6.0 |
|   | c.  | 4.0 |
|   | d.  | 5.5 |
|   | e.  | 4.0 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC055 - Calculate the slope of a secant line passing through given points |
| *OTHER:* | Skill |
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| 13. Consider the function  and the point  on the graph of *f*. Estimate the slope of the tangent line of *f* at . Round your answer to the whole number.​

|  |  |  |
| --- | --- | --- |
|   | a.  | 15 |
|   | b.  | 6 |
|   | c.  | 13 |
|   | d.  | 5 |
|   | e.  | 14 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC058 - Calculate the slope of secant line passing through the given points |
| *OTHER:* | Skill |
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| 14. Use the rectangles in the graph given below to approximate the area of the region bounded by , , , and . Round your answer to three decimal places.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 2.975 units2 |
|   | b.  | 6.871 units2 |
|   | c.  | 4.075 units2 |
|   | d.  | 6.372 units2 |
|   | e.  | 7.397 units2 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.1.3 - Understand that the area problem is also basic to calculus. |
| *OTHER:* | Skill |
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| 15. Consider the length of the graph of  from  to . Approximate the length of the curve by finding the sum of the lengths of four line segments, as shown in following figure. Round your answer to two decimal places.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 6.11 |
|   | b.  | 8.12 |
|   | c.  | 5.66 |
|   | d.  | 8.49 |
|   | e.  | 7.11 |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.1 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC060 - Estimate the length of the curve using a piecewise linear function |
| *OTHER:* | Skill |
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| 1. ​Complete the table and use the result to estimate the limit.​  ​

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1.9 | 1.99 | 1.999 | 2.001 | 2.01 | 2.1 |
|  |  |  |  |  |  |  |

​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​0.482143 |
|   | b.  | ​0.232143 |
|   | c.  | ​–0.142857 |
|   | d.  | ​0.357143 |
|   | e.  | ​–0.517857 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
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| 2. ​Complete the table and use the result to estimate the limit.​  ​

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 0.9 | 0.99 | 0.999 | 1.001 | 1.01 | 1.1 |
|  |  |  |  |  |  |  |

​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​0.015625 |
|   | b.  | ​0.145625 |
|   | c.  | ​–0.114375 |
|   | d.  | ​0.125625 |
|   | e.  | ​–0.094375 |

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| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
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| 3. Complete the table and use the result to estimate the limit.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | –0.1 | –0.01 | –0.001 | 0.001 | 0.01 | 0.1 |
|  |  |  |  |  |  |  |

​

|  |  |  |
| --- | --- | --- |
|   | a.  | –1 |
|   | b.  | –0.5 |
|   | c.  | 0 |
|   | d.  | 0.5 |
|   | e.  | 1 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC061 - Estimate a limit from a table of values |
| *OTHER:* | Skill |
| *DATE CREATED:* | 1/11/2017 9:54 AM |
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| 4. Determine the following limit. (Hint: Use the graph to calculate the limit.)​ ​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 7 |
|   | b.  | 1 |
|   | c.  | 6 |
|   | d.  | 5 |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC062 - Estimate the limit of a function from its graph |
| *OTHER:* | Skill |
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| 5. Let .​ Determine the following limit. (Hint: Use the graph to calculate the limit.)​ ​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 4 |
|   | b.  | 3 |
|   | c.  | 2 |
|   | d.  | 0 |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC062 - Estimate the limit of a function from its graph |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6. Let .​ Determine the following limit. (Hint: Use the graph to calculate the limit.)​ ​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 5 |
|   | b.  | 16 |
|   | c.  | 1 |
|   | d.  | 4 |
|   | e.  | does not exist. |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC062 - Estimate the limit of a function from its graph |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7. Determine the following limit. (Hint: Use the graph to calculate the limit.)​ ​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | –1 |
|   | b.  | 0 |
|   | c.  | –2 |
|   | d.  | 1 |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC062 - Estimate the limit of a function from its graph |
| *OTHER:* | Skill |
| *DATE CREATED:* | 1/11/2017 9:54 AM |
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| 8. A ring has an inner circumference of 9 centimeters. What is the radius of the ring? Round your answer to four decimal places.​

|  |  |  |
| --- | --- | --- |
|   | a.  | 0.7162 centimeter |
|   | b.  | 2.8648 centimeters |
|   | c.  | 1.4324 centimeters |
|   | d.  | 1.6926 centimeters |
|   | e.  | 8.2070 centimeters |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC063 - Solve a linear equation in applications |
| *OTHER:* | Application |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9. A ring has an inner circumference of 7 centimeters. If the ring's inner circumference can vary between 6 centimeters and 7.5 centimeters, how can the radius vary? Round your answer to five decimal places.​

|  |  |  |
| --- | --- | --- |
|   | a.  | Radius can vary between 3.64756 centimeters and 5.69932 centimeters. |
|   | b.  | Radius can vary between 1.38198 centimeters and 1.54510 centimeters. |
|   | c.  | Radius can vary between 0.95493 centimeter and 1.19366 centimeters. |
|   | d.  | Radius can vary between 1.90986 centimeters and 2.38732 centimeters. |
|   | e.  | Radius can vary between 0.11408 centimeter and 1.61408 centimeters. |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC063 - Solve a linear equation in applications |
| *OTHER:* | Application |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10. A sphere has a volume of 3.32 cubic inches. What is the radius of the sphere? Round your answer to four decimal places.​

|  |  |  |
| --- | --- | --- |
|   | a.  | 0.9254 inch |
|   | b.  | 1.4690 inches |
|   | c.  | 0.8903 inch |
|   | d.  | 1.7806 inches |
|   | e.  | 1.6148 inches |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC064 - Solve a cubic equation in applications |
| *OTHER:* | Application |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11. A sphere has a volume of 3.32 cubic inches. If the sphere's volume can vary between 2.52 cubic inches and 5.12 cubic inches, how can the radius vary? Round your answer to five decimal places.​

|  |  |  |
| --- | --- | --- |
|   | a.  | Radius can vary between 0.77563 inch and 1.10558 inches. |
|   | b.  | Radius can vary between 0.12544 inch and 2.72544 inches. |
|   | c.  | Radius can vary between 1.40684 inches and 2.00530 inches. |
|   | d.  | Radius can vary between 1.34006 inches and 1.69726 inches. |
|   | e.  | Radius can vary between 0.84418 inch and 1.06920 inches. |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC063 - Solve a linear equation in applications |
| *OTHER:* | Application |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12. Find the limit *L*.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | none of the above |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.2.0 - Finding Limits Graphically and Numerically |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13. Find the limit *L*.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | none of the above |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.2.0 - Finding Limits Graphically and Numerically |
| *OTHER:* | Skill |
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| 14. What is the limit of  as *x* approaches ?​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | none of the above |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.2.0 - Finding Limits Graphically and Numerically |
| *OTHER:* | Skill |
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| 15. The graph of  is shown in the figure. Find  such that if , then .​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | None of the above |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.2 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | LCalc11.1.2.0 - Finding Limits Graphically and Numerically |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. ​Find the limit.​​​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​405 |
|   | b.  | ​–180 |
|   | c.  | ​450 |
|   | d.  | ​–450 |
|   | e.  | ​0 |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. Find the limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC066 - Evaluate a limit using properties of limits |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3. Find the limit. Round your answer to the whole number, if necessary.​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 3 |
|   | b.  | –5 |
|   | c.  | –3 |
|   | d.  | 5 |
|   | e.  | 2 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC066 - Evaluate a limit using properties of limits |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4. ​Let  and . Find the limit.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​100 |
|   | b.  | ​–27 |
|   | c.  | ​106 |
|   | d.  | ​1,000 |
|   | e.  | ​–8 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5. ​Let  and . Find the limit.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​ |
|   | b.  | ​ |
|   | c.  | ​ |
|   | d.  | ​ |
|   | e.  | ​ |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6. ​Let  and . Find the limits.​​​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​ |
|   | b.  | ​ |
|   | c.  | ​ |
|   | d.  | ​ |
|   | e.  | ​ |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
| *DATE CREATED:* | 1/11/2017 9:53 AM |
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| 7. Find the limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC068 - Evaluate the limit of the function |
| *OTHER:* | Skill |
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| 8. Find the limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | 0 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC066 - Evaluate a limit using properties of limits |
| *OTHER:* | Skill |
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| 9. Find the limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  | 0 |
|   | c.  |  |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC066 - Evaluate a limit using properties of limits |
| *OTHER:* | Skill |
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| 10. Find the limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC066 - Evaluate a limit using properties of limits |
| *OTHER:* | Skill |
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| 11. Suppose that  and . Find the following limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 0 |
|   | b.  | 3 |
|   | c.  | –17 |
|   | d.  | –11 |
|   | e.  | –42 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC069 - Evaluate the limit of a function using properties of limits |
| *OTHER:* | Skill |
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| 12. Suppose that  and . Find the following limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  | –11 |
|   | b.  | –19 |
|   | c.  | –88 |
|   | d.  | ​–3 |
|   | e.  | 0 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC069 - Evaluate the limit of a function using properties of limits |
| *OTHER:* | Skill |
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| 13. Suppose that  and . Find the following limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  | –14 |
|   | b.  | –4 |
|   | c.  | 24 |
|   | d.  | 10 |
|   | e.  | 140 |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC069 - Evaluate the limit of a function using properties of limits |
| *OTHER:* | Skill |
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| 14. Suppose that ​ and . Find the following limit.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​135 |
|   | b.  | ​ |
|   | c.  | ​–135 |
|   | d.  | ​ |
|   | e.  | ​does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
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| 15. Suppose that . Find the following limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 9 |
|   | c.  | 5 |
|   | d.  | 0 |
|   | e.  | 6 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC069 - Evaluate the limit of a function using properties of limits |
| *OTHER:* | Skill |
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| 16. Suppose that . Find the following limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 3 |
|   | b.  | 30 |
|   | c.  | –30 |
|   | d.  |  |
|   | e.  | –10 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC069 - Evaluate the limit of a function using properties of limits |
| *OTHER:* | Skill |
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| 17. ​Find the following limit (if it exists). Write a simpler function that agrees with the given function at all but one point.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​6 |
|   | b.  | ​22 |
|   | c.  | ​–22 |
|   | d.  | ​–6 |
|   | e.  | ​does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
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| 18. ​Find the limit (if it exists).​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​ |
|   | b.  | ​ |
|   | c.  | ​20 |
|   | d.  | ​5 |
|   | e.  | ​ |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
| *DATE CREATED:* | 1/11/2017 9:53 AM |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 19. Find the limit (if it exists).​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 2 |
|   | b.  | 1 |
|   | c.  | 0 |
|   | d.  |  |
|   | e.  | Limit does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC071 - Evaluate the limit of a function analytically |
| *OTHER:* | Skill |
| *DATE CREATED:* | 1/11/2017 9:53 AM |
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| 20. ​Find the limit (if it exists).​​​

|  |  |  |
| --- | --- | --- |
|   | a.  | ​ |
|   | b.  | ​ |
|   | c.  | ​ |
|   | d.  | ​ |
|   | e.  | ​does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *QUESTION TYPE:* | Multiple Choice |
| *HAS VARIABLES:* | True |
| *DATE CREATED:* | 1/11/2017 9:53 AM |
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| 21. Determine the limit (if it exists).​​

|  |  |  |
| --- | --- | --- |
|   | a.  | –1 |
|   | b.  | –8 |
|   | c.  | 3 |
|   | d.  | –4 |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC071 - Evaluate the limit of a function analytically |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22. Determine the limit (if it exists).​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 7 |
|   | b.  | 1 |
|   | c.  | 0 |
|   | d.  | 2 |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC071 - Evaluate the limit of a function analytically |
| *OTHER:* | Skill |
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| 23. Determine the limit (if it exists).​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 0 |
|   | b.  | 1 |
|   | c.  | 2 |
|   | d.  |  |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC071 - Evaluate the limit of a function analytically |
| *OTHER:* | Skill |
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| 24. Find where .​

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 2 |
|   | c.  | –2 |
|   | d.  | 0 |
|   | e.  | Limit does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.3 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC072 - Evaluate the limit of a difference quotient |
| *OTHER:* | Skill |
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| 1. Use the graph as shown to determine the following limits, and discuss the continuity of the function at .​ (i)  (ii)  (iii) ​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 1, 1, 2, not continuous |
|   | b.  | 2, 2, 2, continuous |
|   | c.  | 4, 4, 4, not continuous |
|   | d.  | 2, 2, 2, not continuous |
|   | e.  | 1, 1, 2, continuous |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC073 - Estimate a limit and points of discontinuity from a graph |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. Use the graph as shown to determine the following limits, and discuss the continuity of the function at .​ (i)  (ii)  (iii) ​ ​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 2, 2, 2, continuous |
|   | b.  | 1, 1, 2, not continuous |
|   | c.  | 2, 2, 2, not continuous |
|   | d.  | –3, –3, –3, continuous |
|   | e.  | 1, 1, 2, continuous |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC073 - Estimate a limit and points of discontinuity from a graph |
| *OTHER:* | Skill |
| *DATE CREATED:* | 1/11/2017 9:51 AM |
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| 3. Use the graph to determine the following limits, and discuss the continuity of the function at .​(i)  (ii)  (iii) ​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 2, –2, does not exist, not continuous |
|   | b.  | 2, 0, does not exist, not continuous |
|   | c.  | 0, 2, 0, not continuous |
|   | d.  | –3, 0, does not exist, not continuous |
|   | e.  | ​0, 2, 0, continuous |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC073 - Estimate a limit and points of discontinuity from a graph |
| *OTHER:* | Skill |
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| 4. Find the limit (if it exists).​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  | 0 |
|   | c.  | Limit does not exist. |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC074 - Evaluate one-sided limits |
| *OTHER:* | Skill |
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| 5. Find the limit (if it exists).​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 0 |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | Limit does not exist. |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC074 - Evaluate one-sided limits |
| *OTHER:* | Skill |
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| 6. Find the limit (if it exists).​ , where ​

|  |  |  |
| --- | --- | --- |
|   | a.  | Limit does not exist. |
|   | b.  | 0 |
|   | c.  | 2 |
|   | d.  | 3 |
|   | e.  | 6 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC074 - Evaluate one-sided limits |
| *OTHER:* | Skill |
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| 7. Find the limit (if it exists). Note that  represents the greatest integer function.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 18 |
|   | b.  | –17 |
|   | c.  | 17 |
|   | d.  | –18 |
|   | e.  | does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC074 - Evaluate one-sided limits |
| *OTHER:* | Skill |
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| 8. Find the limit (if it exists). Note that  represents the greatest integer function.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 9 |
|   | b.  | Limit does not exist. |
|   | c.  | 8 |
|   | d.  | 0 |
|   | e.  | 7 |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC074 - Evaluate one-sided limits |
| *OTHER:* | Skill |
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| 9. Discuss the continuity of the function .​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  is discontinuous at . |
|   | b.  |  is discontinuous at . |
|   | c.  |  is discontinuous at . |
|   | d.  |  is continuous for all real . |
|   | e.  |  is continuous at . |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC075 - Identify the discontinuities of a function if any exist |
| *OTHER:* | Skill |
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| 10. Find the *x*-values (if any) at which the function  is not continuous. Which of the discontinuities are removable?​

|  |  |  |
| --- | --- | --- |
|   | a.  | , removable |
|   | b.  | , removable |
|   | c.  | , not removable |
|   | d.  | continuous everywhere |
|   | e.  | , not removable |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC076 - Identify the removable discontinuities of a function |
| *OTHER:* | Skill |
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| 11. Find the *x-*values (if any) at which  is not continuous.​

|  |  |  |
| --- | --- | --- |
|   | a.  |  is not continuous at  and  has a removable discontinuity at . |
|   | b.  |  is not continuous at  and both the discontinuities are nonremovable. |
|   | c.  |  is not continuous at  and  has a removable discontinuity at . |
|   | d.  |  is not continuous at  and  has a removable discontinuity at . |
|   | e.  |  is continuous for all real . |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC076 - Identify the removable discontinuities of a function |
| *OTHER:* | Skill |
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| 12. Find the *x*-values (if any) at which the function  is not continuous. Which of the discontinuities are removable?​

|  |  |  |
| --- | --- | --- |
|   | a.  | discontinuous everywhere 000 |
|   | b.  | 1 and - , removable |
|   | c.  | 1 and - , not removable |
|   | d.  | continuous everywhere 000 |
|   | e.  | 0, removable |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC076 - Identify the removable discontinuities of a function |
| *OTHER:* | Skill |
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| 13. Find the *x*-values (if any) at which the function  is not continuous. Which of the discontinuities are removable?​

|  |  |  |
| --- | --- | --- |
|   | a.  | no points of discontinuity |
|   | b.  |  (not removable),  (removable) |
|   | c.  |  (removable),  (not removable) |
|   | d.  | no points of continuity |
|   | e.  |  (not removable),  (not removable) |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC076 - Identify the removable discontinuities of a function |
| *OTHER:* | Skill |
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| 14. Find the *x-*values (if any) at which  is not continuous.​

|  |  |  |
| --- | --- | --- |
|   | a.  |  is not continuous at  and the discontinuity is nonremovable. |
|   | b.  |  is not continuous at  and the discontinuity is removable. |
|   | c.  |  is continuous for all real . |
|   | d.  |  is not continuous at  and the discontinuity is removable. |
|   | e.  |  is not continuous at  and  is a removable discontinuity. |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC076 - Identify the removable discontinuities of a function |
| *OTHER:* | Skill |
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| 15. Find the constant *a* such that the function​ ​ is continuous on the entire real line.​

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | –11 |
|   | c.  | 11 |
|   | d.  | 13 |
|   | e.  | –13 |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC077 - Identify the value of a parameter to ensure a function is continuous |
| *OTHER:* | Skill |
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| 16. Find the constants *a* and *b* such that the function​ ​ is continuous on the entire real line.​

|  |  |  |
| --- | --- | --- |
|   | a.  | ,  |
|   | b.  | ,  |
|   | c.  | ,  |
|   | d.  | ,  |
|   | e.  | ,  |

|  |  |
| --- | --- |
| *ANSWER:* | c |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC077 - Identify the value of a parameter to ensure a function is continuous |
| *OTHER:* | Skill |
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| 17. Find the value of *c* guaranteed by the Intermediate Value Theorem.​ , , ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 5 |
|   | c.  | 7 |
|   | d.  | 2 |
|   | e.  | 6 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC078 - Identify the value of c guaranteed by the Intermediate Value Theorem |
| *OTHER:* | Skill |
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| 18. Find the value of *c* guaranteed by the Intermediate Value Theorem.​ , , ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 9 |
|   | b.  | 2 |
|   | c.  | 1 |
|   | d.  | 7 |
|   | e.  | 8 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC078 - Identify the value of c guaranteed by the Intermediate Value Theorem |
| *OTHER:* | Skill |
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| 19. A long distance phone service charges $0.55 for the first 8 minutes and $0.05 for each additional minute or fraction thereof. Use the greatest integer function to write the cost *C* of a call in terms of time *t* (in minutes).​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC038 - Create functions in applications |
| *OTHER:* | Application |
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| 20. Find all values of *c* such that  is continuous on .​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  | ,  |
|   | e.  | ,  |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.4 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC077 - Identify the value of a parameter to ensure a function is continuous |
| *OTHER:* | Skill |
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| 1. Determine whether  approaches  or  as *x* approaches  from the left and from the right by completing the tables below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | –3.5 | –3.1 | –3.01 | –3.001 |
|  |  |  |  |  |

​

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | –2.999 | –2.99 | –2.9 | –2.5 |
|  |  |  |  |  |

​

|  |  |  |
| --- | --- | --- |
|   | a.  | ,  |
|   | b.  | ,  |
|   | c.  | ​,  |
|   | d.  | ​,  |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC079 - Evaluate an infinite limit from a table of values |
| *OTHER:* | Skill |
| *DATE CREATED:* | 1/11/2017 9:49 AM |
| *DATE MODIFIED:* | 1/11/2017 9:49 AM |

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| 2. Find all the vertical asymptotes (if any) of the graph of the function .​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | no vertical asymptotes |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC080 - Identify the vertical asymptotes (if any) of the graph of a function |
| *OTHER:* | Skill |
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| 3. Find the vertical asymptotes (if any) of the function .​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  | ​ |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC080 - Identify the vertical asymptotes (if any) of the graph of a function |
| *OTHER:* | Skill |
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| 4. Find all the vertical asymptotes (if any) of the graph of the function .​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  | ,  |
|   | e.  | no vertical asymptotes |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC080 - Identify the vertical asymptotes (if any) of the graph of a function |
| *OTHER:* | Skill |
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| 5. Find all the vertical asymptotes (if any) of the graph of the function .​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  | no vertical asymptotes |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC080 - Identify the vertical asymptotes (if any) of the graph of a function |
| *OTHER:* | Skill |
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| 6. Find all vertical asymptotes (if any) of the function .​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  |  |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC080 - Identify the vertical asymptotes (if any) of the graph of a function |
| *OTHER:* | Skill |
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| 7. Find the vertical asymptotes (if any) of the function .​

|  |  |  |
| --- | --- | --- |
|   | a.  |   |
|   | b.  |   |
|   | c.  |   |
|   | d.  |   |
|   | e.  | no vertical asymptotes |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC080 - Identify the vertical asymptotes (if any) of the graph of a function |
| *OTHER:* | Skill |
| *DATE CREATED:* | 1/11/2017 9:49 AM |
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| 8. Find the limit.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  |  |
|   | c.  | 0 |
|   | d.  |  |
|   | e.  | –1 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC074 - Evaluate one-sided limits |
| *OTHER:* | Skill |
| *DATE CREATED:* | 1/11/2017 9:49 AM |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9. Find the limit.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  | 14 |
|   | d.  | –7 |
|   | e.  | –14 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC081 - Evaluate the limit of a function |
| *OTHER:* | Skill |
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| *DATE MODIFIED:* | 1/11/2017 9:49 AM |

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| 10. Find the limit.​​

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 0 |
|   | c.  |  |
|   | d.  |  |
|   | e.  |  |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC074 - Evaluate one-sided limits |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11. Find the limit (if it exists).​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  | 0 |
|   | d.  |  |
|   | e.  | Limit does not exist |

|  |  |
| --- | --- |
| *ANSWER:* | e |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC082 - Identify a limit that does not exist |
| *OTHER:* | Skill |
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| *DATE MODIFIED:* | 1/11/2017 9:50 AM |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12. Use a graphing utility to graph the function  and determine the one-sided limit .​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  |  |
|   | c.  | 0 |
|   | d.  | 27 |
|   | e.  | 18 |

|  |  |
| --- | --- |
| *ANSWER:* | b |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC083 - Estimate one-sided limits from a graph |
| *OTHER:* | Skill |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13. Use a graphing utility to graph the function  and determine the following one-sided limit.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  | 6 |
|   | c.  | –6 |
|   | d.  |  |
|   | e.  | 0 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC083 - Estimate one-sided limits from a graph |
| *OTHER:* | Skill |
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| 14. A 25-foot ladder is leaning against a house (see figure). If the base of the ladder is pulled away from the house at a rate of 2 feet per second, the top will move down the wall at a rate of  ft/sec, where *x* is the distance between the base of the ladder and the house. Find the rate *r* when *x* is 24 feet.​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  | *r* =  ft/sec |
|   | b.  | *r* = ft/sec |
|   | c.  |  ft/sec |
|   | d.  | *r* = ft/sec |
|   | e.  | *r* = ft/sec |

|  |  |
| --- | --- |
| *ANSWER:* | a |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Easy |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC084 - Evaluate functions in applications |
| *OTHER:* | Application |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15. A 30-foot ladder is leaning against a house (see figure). If the base of the ladder is pulled away from the house at a rate of 2 feet per second, the top will move down the wall at a rate of  ft/sec, where *x* is the distance between the base of the ladder and the house. Find the limit of *r* as .​ ​

|  |  |  |
| --- | --- | --- |
|   | a.  |  |
|   | b.  | 60 |
|   | c.  | 0 |
|   | d.  |  |
|   | e.  | 30 |

|  |  |
| --- | --- |
| *ANSWER:* | d |
| *POINTS:* | 1 |
| *DIFFICULTY:* | Medium |
| *REFERENCES:* | Section 1.5 |
| *QUESTION TYPE:* | Multi-Mode (Multiple choice) |
| *HAS VARIABLES:* | True |
| *LEARNING OBJECTIVES:* | CALC085 - Evaluate limits in applications |
| *OTHER:* | Application |
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