|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. Determine whether the statement below is true for all real numbers *b*.  ​  |*b* + 2| = |*b*| + 2   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3. Suppose *a* and *b* are real numbers other than zero and that *a < b.* State whether the inequality is true or false.  *<*   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4. If , then .   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5. A manufacturer of a certain commodity has estimated that her profit in thousands of dollars is given by the expression  ​  ​  where *x* (in thousands) is the number of units produced.  ​  What production range will enable the manufacturer to realize a profit of at least $14,000 on the commodity?  ​   |  |  |  | | --- | --- | --- | |  | a. | Between 2,000 and 9,000 units. | |  | b. | Between 2,000 and 5,000 units. | |  | c. | Between 1,000 and 5,000 units. | |  | d. | Between 1,000 and 7,000 units. | |  | e. | Between 1,000 and 9,000 units. |  |  |  | | --- | --- | | *ANSWER:* | c | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6. Rationalize the numerator of the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7. Rationalize the denominator of the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8. Use the fact that ≈3.162 to evaluate the expression without using a calculator.   |  |  |  | | --- | --- | --- | |  | a. | 31.62 | |  | b. | 3.162 | |  | c. | 316.2 | |  | d. | 31,620 | |  | e. | 3,162 |  |  |  | | --- | --- | | *ANSWER:* | c | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9. Use the fact that ≈ 1.778 to evaluate the expression without using a calculator.   |  |  |  | | --- | --- | --- | |  | a. | 0.1778 | |  | b. | 0.01778 | |  | c. | 1,778 | |  | d. | 17.78 | |  | e. | 178 |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10. Simplify the expression. (Assume that *r*, *s*, and *t* are positive.)   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 11. Evaluate the expression.   |  |  |  | | --- | --- | --- | |  | a. | –64 | |  | b. | –256 | |  | c. | –81 | |  | d. | 81 | |  | e. | 64 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12. Determine whether the statement is true or false.   |  |  |  | | --- | --- | --- | |  | a. | False | |  | b. | True |  |  |  | | --- | --- | | *ANSWER:* | a | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13. Determine whether the statement is true or false.  >   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14. Show the interval [6, 8) on a number line.  ​   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. |  | b. |  | |  | c. |  | d. |  | |  | e. |  |  |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15. Evaluate the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. | 6 | |  | d. |  | |  | e. | - 6 |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 16. Evaluate the expression.  ​  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17. Suppose *a* and *b* are real numbers other than zero and that *a* > *b*. State whether the inequality is true or false.  >    |  |  |  | | --- | --- | --- | |  | a. | False | |  | b. | True |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 18. Evaluate the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. | 243 | |  | c. | 81 | |  | d. | 3 | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 19. Rewrite the expression using positive exponents only.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 20. Simplify the expression. (Assume *x* and *y* are positive.)   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 21. Determine whether the statement below is true for all real numbers *a*.  |*a* + 2| = |*a*| + 2   |  |  |  | | --- | --- | --- | |  | a. | False | |  | b. | True |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 22. Rationalize the denominator of the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 23. Rationalize the numerator of the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 24. Find the maximum profit *P* (in dollars) given that  8(*P* - 2300) ≤ 6(*P* + 2000).   |  |  |  | | --- | --- | --- | |  | a. | $ 15650 | |  | b. | $ 7600 | |  | c. | $ 15200 | |  | d. | $ 16100 | |  | e. | $ 22800 |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 25. Find the minimum profit *P* (in dollars) given that  .   |  |  |  | | --- | --- | --- | |  | a. | $ 1,640 | |  | b. | $ 1,900 | |  | c. | $ 1,400 | |  | d. | $ 1,280 | |  | e. | $ 1,520 |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 26. A salesman's monthly commission is 25% on all sales over $14,000. If his goal is to make a commission of at least $3,600/month, what minimum monthly sales figures must he attain?   |  |  |  | | --- | --- | --- | |  | a. | $ 17,600 | |  | b. | $ 15,800 | |  | c. | $ 21,200 | |  | d. | $ 24,800 | |  | e. | $ 28,400 |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 27. Simplify the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 28. The diameter *x* (in inches) of a batch of ball bearings manufactured by PAR Manufacturing satisfies the inequality    What is the largest diameter a ball bearing in the batch can have?   |  |  |  | | --- | --- | --- | |  | a. | 0.4 inches | |  | b. | 0.41 inches | |  | c. | 0.43 inches | |  | d. | 0.47 inches | |  | e. | 0.45 inches |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 29. Evaluate the expression.   |  |  |  | | --- | --- | --- | |  | a. | 1 | |  | b. | 6 | |  | c. | 7 | |  | d. | 9 | |  | e. | 4 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 30. Determine whether the statement is true or false.  If a > b, then a + c < b + c.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 31. Find the values of *x* that satisfy the inequalities.  and   |  |  |  | | --- | --- | --- | |  | a. | (- ∞, –5] ∪ (9, ∞) | |  | b. | [–5, 9) | |  | c. | (- ∞, –5) ∪[9, ∞) | |  | d. | (- ∞, 9] | |  | e. | (–5, 9] |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 32. Find the values of *x* that satisfy the inequalities.  x - 6 > 3 and x + 4 ≤ 3   |  |  |  | | --- | --- | --- | |  | a. | (-1, 9] | |  | b. | (- ∞, -1) ∪ [9, ∞) | |  | c. | (- ∞, -1] ∪ (9, ∞) | |  | d. | (- ∞, 9] | |  | e. | [-1, 9) |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 33. Evaluate the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. | 216 | |  | c. |  | |  | d. | 15,625 | |  | e. | 6 |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 34. Simplify the expression.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 35. Use the fact that the 3 ≈ 1.732 to evaluate the expression without using a calculator.  3  Round the answer to the nearest thousandth.   |  |  |  | | --- | --- | --- | |  | a. | 15.588 | |  | b. | 43.075 | |  | c. | 5.196 | |  | d. | 46.765 | |  | e. | 24.994 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| --- | --- | --- |
| 36. Evaluate the expression.   |  |  | | --- | --- | | *ANSWER:* | 64 | |

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| --- | --- | --- |
| 37. Use the fact that 10 ≈ 3.162 to evaluate the expression without using a calculator.   |  |  | | --- | --- | | *ANSWER:* | 31,620 | |

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| --- | --- | --- |
| 38. Evaluate the expression.   |  |  | | --- | --- | | *ANSWER:* | 4 | |

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| --- | --- | --- |
| 39. Evaluate the expression.   |  |  | | --- | --- | | *ANSWER:* | 1 | |

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| --- | --- | --- |
| 40. Find the maximum profit *P* (in dollars) given that  12(*P* - 2,700) ≤ 10(*P* + 2,600)  $ \_\_\_\_\_\_\_\_\_\_   |  |  | | --- | --- | | *ANSWER:* | 29,200 | |

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| --- | --- | --- |
| 41. A salesman's monthly commission is 25% on all sales over $13,000. If his goal is to make a commission of at least $4,500/month, what minimum monthly sales figures must he attain?  $ \_\_\_\_\_\_\_\_\_\_   |  |  | | --- | --- | | *ANSWER:* | 31,000 | |

|  |  |  |
| --- | --- | --- |
| 42. The diameter *x* (in inches) of a batch of ball bearings manufactured by PAR Manufacturing satisfies the inequality    What is the smallest diameter a ball bearing in the batch can have? Give your answer to two decimal places, if necessary.  \_\_\_\_\_\_\_\_\_\_ inches   |  |  | | --- | --- | | *ANSWER:* | 0.76 | |

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| --- | --- | --- |
| 43. Evaluate the expression.   |  |  | | --- | --- | | *ANSWER:* | 1 | |

|  |  |  |
| --- | --- | --- |
| 44. Use the fact that the to evaluate the expression without using a calculator.    Round the answer to the nearest thousandth, if necessary.   |  |  | | --- | --- | | *ANSWER:* | 5.196 | |

|  |  |  |
| --- | --- | --- |
| 45. Simplify the expression. (Assume that *r*, *s*, and *t* are positive.)   |  |  | | --- | --- | | *ANSWER:* |  | |

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| 46. Rationalize the numerator of the expression.   |  |  | | --- | --- | | *ANSWER:* |  | |

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| 47. Rewrite the expression using positive exponents only.   |  |  | | --- | --- | | *ANSWER:* |  | |

|  |  |  |
| --- | --- | --- |
| 48. Simplify the expression. (Assume *x* and *y* are positive.)   |  |  | | --- | --- | | *ANSWER:* |  | |

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| --- | --- | --- |
| 49. Rationalize the denominator of the expression.   |  |  | | --- | --- | | *ANSWER:* |  | |

|  |  |  |
| --- | --- | --- |
| 50. Rationalize the numerator of the expression.   |  |  | | --- | --- | | *ANSWER:* |  | |

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| --- | --- | --- |
| 51. Simplify the expression.   |  |  | | --- | --- | | *ANSWER:* |  | |

|  |  |  |
| --- | --- | --- |
| 52. Evaluate the expression.   |  |  | | --- | --- | | *ANSWER:* |  | |

|  |  |  |
| --- | --- | --- |
| 53. Simplify the expression.   |  |  | | --- | --- | | *ANSWER:* |  | |

|  |  |  |
| --- | --- | --- |
| 54. A manufacturer of a certain commodity has estimated that her profit in thousands of dollars is given by the expression    where *x* (in thousands) is the number of units produced.  What production range will enable the manufacturer to realize a profit of at least $14,000 on the commodity?  Between                 and                 units.   |  |  | | --- | --- | | *ANSWER:* |  | |

|  |  |  |
| --- | --- | --- |
| 55. Determine whether the statement is *true* or *false*.   |  |  | | --- | --- | | *ANSWER:* | true | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Match each interval with the corresponding number line.  ​  *Choose the correct letter for each question.*  ​   |  |  |  |  | | --- | --- | --- | --- | | a. | [4, 9] | b. | (4, 9) | | c. | (-6, ∞) | d. | (-∞, 6] | |

|  |  |  |
| --- | --- | --- |
| 56.   |  |  | | --- | --- | | *ANSWER:* | c | |

|  |  |  |
| --- | --- | --- |
| 57.   |  |  | | --- | --- | | *ANSWER:* | b | |

|  |  |  |
| --- | --- | --- |
| 58.   |  |  | | --- | --- | | *ANSWER:* | d | |

|  |  |  |
| --- | --- | --- |
| 59.   |  |  | | --- | --- | | *ANSWER:* | a | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Match each pair of inequalities with the corresponding values of *x*.  *Choose the correct letter for each question.*   |  |  | | --- | --- | | a. | *x* - 5 ≤ 5 and *x* + 3 > 2 | | b. | *x* - 5 ≤ 5 and *x* + 3 ≥ 2 | | c. | *x* - 5 ≥ 5 and *x* + 3 ≤ 2 | | d. | *x* - 5 > 5 and *x* + 3 ≤ 2 | |

|  |  |  |
| --- | --- | --- |
| 60. [–1, 10]   |  |  | | --- | --- | | *ANSWER:* | b | |

|  |  |  |
| --- | --- | --- |
| 61. (-∞, –1] ∪ (10, ∞)   |  |  | | --- | --- | | *ANSWER:* | d | |

|  |  |  |
| --- | --- | --- |
| 62. (-∞, –1] ∪ [10, ∞)   |  |  | | --- | --- | | *ANSWER:* | c | |

|  |  |  |
| --- | --- | --- |
| 63. (–1, 10]   |  |  | | --- | --- | | *ANSWER:* | a | |