LESSON 173 Review: Conic Sections, Sequences, and Series

Try to complete as fast as you can. You may use a calculator unless otherwise specified.

1. What is the distance between $(-1, 5)$ and $(-7, 3)$? Write your answer in simplest radical form.

2. What is the midpoint between $(5, 1)$ and $(-3, -9)$?

3. Which equation describes a circle with center $(-2, 4)$ and radius 3 ?

A) $(x + 2)^2 + (y - 4)^2 = 3$

B) $(x - 2)^2 + (y + 4)^2 = 3$

C) $(x + 2)^2 + (y - 4)^2 = 9$

D) $(x - 2)^2 + (y + 4)^2 = 9$

4. $x^2 + y^2 - 8x + 2y + 1 = 0$

Which statement is true about the circle defined by the equation above?

A) center $(4, -1)$, radius $= 4$

B) center $(-4, 1)$, radius $= 4$

C) center $(4, -1)$, radius $= 16$

D) center $(-4, 1)$, radius $= 16$

5. A circle has a diameter with endpoints $(-2, 0)$ and $(-4, 4)$. Write its equation in general (expanded) form.

6. Which statement is true about a parabola with focus $(3, -1)$ and directrix $y = 1$. Select all that apply.

A) The parabola opens down.

B) The vertex is $(3, 0)$.

C) The axis of symmetry is $y = 3$.

D) $(0, -3)$ is on the parabola.

7. Write an equation of the parabola in vertex form whose focus is $(3, 0)$ and directrix is $x = 1$.

8. $(x + 2)^2 + y^2 = 8$

$y = x + 2$

Solve the system above.

9. $y = (x - 1)^2$

$2x + y = 1$

Solve the system above.

10. $y = x^2 + 3$

$y = 4x + k$

For what value of k does the system of equations above have exactly one real solution?

11. In a certain sequence, the first term is 5 and each term after the first is 4 more than the previous term. What is the 25th term of the sequence?

12. $p, 1, 7, q, 19, 25, \ldots$

In the arithmetic sequence above, what is the value of $p + q$?

13. In a certain geometric sequence, the first term is 5 and the second term is -10. What is the 6th term of this sequence?

14. $a_n = 3n - 2$

Write the recursive rule for the sequence defined by the rule above.

15. $a_n = 3(2)^{n-1}$

Write the recursive rule for the sequence defined by the rule above.

16. $5 + 8 + 11 + 14 + 17$

Which sigma notation is equivalent to the series above?

A) $\sum_{k=5}^{17} k$ B) $\sum_{k=2}^{6} k + 3$

C) $\sum_{k=1}^{5} 5k$ D) $\sum_{k=1}^{5} 3k + 2$

17. $2, 9, 16, 23, 30, \ldots$

Find the sum of the first 30 terms of the sequence above.

18. $1, 5, 25, 125, 625, \ldots$

Find the sum of the first 8 terms of the sequence above.

19. Henry put \$2,500 in his savings account with a simple interest rate of 4% per year. What will be the balance of his account at the end of the 10th year?

20. A ball is dropped from a height of 40 meters. After each bounce, it rises to 50% of its previous height. How high will the ball rebound after its fifth bounce?

21. While training for a marathon, Lucas increases his distance by 0.5 miles each day. If he runs 5 miles on the first day, what will be the total distance that he runs for 25 days of training?

22. (CHALLENGE) If (x, y) is a solution to the the system of inequalities $y \geq x^2$ and $y \leq x + 2$, what is the maximum possible value of y ?