For all questions, "NOTA" means none of the above answers is correct.

1. Find the distance between the two points (- 3, 4) and (- 5, -7).

   A.   11   B. $5\sqrt{5}$ C. $6\sqrt{3}$ D. 13   E. NOTA

2. Given a line segment with one endpoint (5, 7) and the midpoint (2, - 9), find the other endpoint.

   A.   (- 1, - 25)   B. (1, 25)   C. (3.5, 1)   D. (3.5, - 1)   E. NOTA

3. Find the slope of the line perpendicular to the line expressed by the equation $4x - y = 5$.

   A. 4   B. 0.25   C. -0.25 D. -4 E. Nota

4. The intersection of a cone and a plane parallel to the base of the cone is a(n)

   A. circle   B. ellipse   C. hyperbola   D. parabola   E. NOTA

5. Reflect the line $4x - 2y = 9$ about the line $y = x$. Find the equation of the reflected line.

   A. $4x + 2y = 9$ B. $2x + 4y = 9$ C. $4x - 2y = -9$ D. $2x - 4y = -9$ E. NOTA

6. Find the radius of the circle: $x^2 + y^2 - 4x + 6y - 11 = 0.$

   A. $\sqrt{11}$ B. 5   C. $\sqrt{22}$ D. $2\sqrt{6}$ E. NOTA

7. The intersection of the lines $2x - 3y = 21$ and $x - 2y = 13$ is the point (a, b). Find a + b.

   A. -2   B. 1   C. 3   d. 5   e. NOTA

8. The equation $4x^2 - y^2 - 24x + 4y - 32 = 0$ represents a conic section. Find the distance between the foci.

▣ EMBED Equation.DSMT4 ▣▣▣

9. Find the equation of the axis of symmetry of the following parabola: $x^2 - 8x + 8y + 19 = 0$.

   A. x = - 4   B. x = - 3   C. x = 3   D. x = 4   E. NOTA

10. A very small lady bug is lost on a coordinate grid. She only travels north, south, east, or west. She never travels diagonally. In fact, she is stuck in a pattern of movement: 2 units north, then 1 unit west, followed by 1 unit south, and finally 2 units east. She continues this pattern at a constant rate of one-half unit per minute, never stopping.   The lady bug is currently at the point (- 5,- 2), and will arrive at the ordered pair (a, b) in one hour. Find a + b.

   A. 3   B. 12   C. 24   D. 37   E. NOTA

11. The equation of the line perpendicular to the line 3x – 5y = 7 and passing through the point (5, -2) is written in Ax + By + C = 0 form where A > 0 and A, B, and C are relatively prime. Find A + B + C.

   A. 20   B. 11   C. 2   D. -2   E. NOTA

12. Find the shortest distance from the point (6, - 8) and the line 7x – 6y = 5.

   A.   8.5   B. $\sqrt{85}$ C. $\dfrac{18\sqrt{85}}{17}$ D. $\dfrac{19\sqrt{85}}{17}$ E. NOTA

13. The function h(x) is the function g(x) = $2x^3 - 3x^2 + 4x - 5$ after it is shifted three units to the left.

Find h(x).

A. $h(x) = 2x^3 + 3x^2 + 13x + 34$ B. $h(x) = 2x^3 - 19x^2 + 76x - 98$

C. $h(x) = 2x^3 + 15x^2 + 40x + 34$ D. $h(x) = 2x^3 + 15x^2 + 54x - 98$ E. NOTA

14. The locus of points in a plane equidistant from a given point and a fixed line is a(n)

A. circle   B. ellipse   C. hyperbola   D. parabola   E. NOTA

15. Find the shortest distance between the point (5, 1) and the circle $x^2 + y^2$ -18x + 6y +88 = 0.

A. $4\sqrt{2}$ B. $3\sqrt{2}$ C. $2\sqrt{2}$ D. $\sqrt{3} - \sqrt{2}$ E. NOTA

16. Find the center of the conic: $3x^2 - 2y^2 - 18x - 20y - 47 = 0.$

A. (3, -5)   B. (- 3, -5)   C. (5, -3)   D. (3, 5)   E. NOTA

17. The direction the parabola described by the equation, $(4 - y)^2 = 2 + 4x,$ opens is

A. Upward   B. Downward   C. Right   D. Left   E. Nota

18. The area of an ellipse is 36π, and the length of the major axis is 18. Find the distance between the foci.

A. $2\sqrt{37}$ B. $2\sqrt{47}$ C. $2\sqrt{65}$ D. $2\sqrt{85}$ E. NOTA

19. The vertices of a given triangle ABC are (-8, 4), (2, 5), and (9, -12). Find the area of triangle ABC.

    A. 89.6   B. 89.5   C. 88.5   D. 88.4   E. NOTA

20. The intersection of the lines $2x + 3y = -1$ and $5x - 7y = 70$ is the center of a circle. The circumference of the same circle is 15π. Find the equation of the circle in standard form.

    A. $4x^2 + 4y^2$ - 56x + 40y + 71 = 0   B. $x^2 + y^2$ - 14x + 10y + 30 = 0

    C. $4x^2 + 4y^2$ - 56x + 40y + 65 = 0   D. $x^2 + y^2$ - 14x + 10y + 59 = 0   E. NOTA

21. Find the length of the conjugate axis of the hyperbola: $x^2 - 4y^2$ + 10x + 24y + 25 = 0.

    A. 3   B. 6   C. 9   D. 12   E. NOTA

22. Find the area of the triangle formed by the intersection of the line y = 6 and the graph of

    y = |x - 3| - 2.

    A. 68   B. 64   C. 60   D. 56   E. NOTA

23. Find the midpoint of segment AB where   A denotes the coordinates of the y-intercept of $4x - y = 7$ and B denotes the coordinates of the x-intercept of $5x + y = 10$.

    A. (0.875,   5)   B. (1, -3.5)   C. (5, 0.875)   D. (1, 0.875)

24. The moon's orbit is an ellipse with the earth at one focus. The length of the major axis is approximately 500,000 miles and the eccentricity is about .05.   Find the greatest distance (in miles) from the earth to the moon using these approximations.

A. 225,000   B. 237,500   C. 262,500   D. 275,000   E. NOTA

25. Find the radius of the circle that passes through the points A(1, -2), B(5,4). And C(10, 5).

A. 8   B. $\sqrt{65}$ C. $4\sqrt{17}$ D. $\sqrt{70}$ E. NOTA

26. Find the equations of the asymptotes of the given hyperbola:

$$49y^2 - 4x^2 + 98y - 48x - 291 = 0.$$

A. 7x − 2y = - 40   and   7x + 2y = - 44

B. 7x − 2y = 44   and   7x + 2y = 40

C. 2x − 7y = 19   and   2x + 7y = 5

D. 2x − 7y = - 5   and   2x + 7y = - 19

E. NOTA

27. The circle, $x^2 + y^2 = 25,$ and the parabola, y = $- x^2 + 5,$ intersect in three points. The three points are:

A. (0, 5), (- 4, - 3), (4, - 3)   B. (0, 5), (- 4, 3), (4, 3)   C. (0, 5), (- 3, - 4), (3, - 4)

D.   (0, 5), (- 3, 43), (3, 4)   E. NOTA

28. Find the true statements given the following function: f(x) = $\dfrac{x^2 - 9}{x^2 - 4}$

I. There are vertical asymptotes at x = 3 and x = - 3.

II. There is a horizontal asymptote at y = 1.

III. There is an oblique asymptote at y = 2x - 3.

IV. The domain of f(x) is all real numbers excluding x = - 2 or 2.

    A. I, III   B. I, II   C. I, III, IV   D. II, IV   E. NOTA

29. The x-intercepts of the parabola y = $4x^2$ - 12x + 3 are (a, 0) and (b, 0). Find a + b.

    A. − 0.75   B. 0.75   C. 3   D. 12   E. NOTA

30. Which of the following functions are even functions?

        I. f(x) = |x| + 3

        II. $f(x) = x^4 - 4x^2 + 2$

        III. $f(x) = x^3 - x + 1$

    A. I only   B. II only   C. I and II   D. I, II, and III   E. NOTA