

Name: \_\_\_\_\_ Period: \_\_\_\_ Date: \_\_\_\_\_

Vocabulary: Define each word and give an example.

1. closed interval
2. Cartesian plane
3. discriminant

Short Answer:

4. Write the midpoint formula.
5. Write the equation of a vertical line and describe its slope.
6. Use both inequality and interval notation to describe the set of numbers: The real numbers less than -6.
7. Name the algebraic property illustrated:  $(6x + 4y) + 3 = 6x + (4y + 3)$

Problems:

\*\*Be sure to show all work used to obtain your answer. Circle or box in the final answer.\*\*

8. Simplify:  $\frac{(z^2y^{-4})^{-3}}{(z^{-3}y^5)^{-1}}$

9. Write the number in scientific notation: 809,000,000

10. Find the distance between the two points.  $(-1,3),(-4,-8)$

11. Find the standard form equation for the circle: Center:  $(-3,4)$ ,  $r = 5$

12. A restaurant purchases a delivery vehicle for \$18,000. It depreciates \$3000 a year for 6 years.

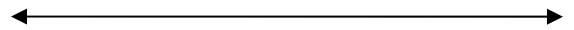
- a. What are the values that  $x$  can take?
- b. Write a linear equation (model) to find the value  $y$  after  $x$  years.
- c. Find the value of the vehicle after 4 years.

13. Find an equation of the line that contains  $(-3,10)$  and  $(-2,5)$ . Write in slope-intercept form.

14. Write an equation for the line through the point  $(-3, -2)$  and perpendicular to the line with equation  $2x - 3y - 5 = 0$ . Write the equation in general form.

15. Solve the equation:  $\frac{3z-6}{5} = \frac{z}{8} - 2$

16. Solve the inequality and graph:  $\frac{3}{2}(3-x) + 2x \leq 8(x-1)$



17. Solve algebraically:

$$|8 - 6x| = 14$$

18. Solve graphically (Calculator):

$$4x^3 - 2x^2 - 4x - 1 = 0$$

19. Solve the equation by completing the square. Show all steps.

$$x^2 + 5 = 8x$$

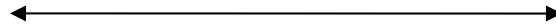
20. Solve by factoring:

$$18x^2 - 9x - 5 = 0$$

21. Solve the inequality  $|2x - 1| \leq 4$  algebraically. Write the solution in interval notation and draw its number line graph.



22. Solve the inequality  $\left| \frac{3x+1}{2} \right| > 7$  algebraically. Write the solution in interval notation and draw its number line graph.



23. Solve the inequality  $x^2 - 6x + 8 \leq 0$ . Express your answer in interval notation.

24. Solve the inequality graphically (calculator). Express your answer in interval notation.

$$x^2 - 3x + 1 > 0$$

25. A vacant lot has area 7670 sq. ft. Its length is 53 ft more than its width. Find the dimensions of the lot.