

## ALGEBRA 3 DISTANCE LEARNING ASSIGNMENT

INSTRUCTIONS: Below is a compilation of the lessons that have been discussed in Algebra 3. **Show all your work.** Each problem answered correctly is worth half point which will count as **extra credit on the test.** You will turn it in when we come back.

NAME: \_\_\_\_\_ PERIOD: \_\_\_\_\_

1. Perform the indicated operation.

a.  $(5 + 3i) + (-2 + 8i)$

b.  $(-17 - 6i) - (3 - 10i)$

c.  $(5 - 2i)(3 + 4i)$

d.  $i^{47}$

2. Rationalize  $\frac{4+2i}{5-3i}$

3. Classify the polynomial  $3x^5 - 7x + 8x^4 - 10$  by degree and the number of terms.

4. Perform the indicated operation.

a.  $(3x - 5)(4x + 3)$

b.  $(2x^5 - 4x^3 + 3x - 5) - (3x^4 + 10x^3 - 8x + 13)$

5. Name the smallest subset of real numbers to which each number belongs.

a. -17

b. 0

c. .57

6. Simplify each radical expression  $\sqrt{147m^3n^3}$

7. Convert  $5^{3/7}$  to radical form

8. Convert  $x^{2/3}$  to a rational exponent.

9. Simplify each rational expression using the laws of exponents.

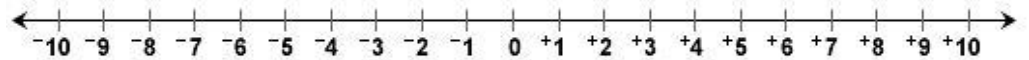
$\frac{4^{-1}b}{4^5b^2}$

10. Find the indicated set if

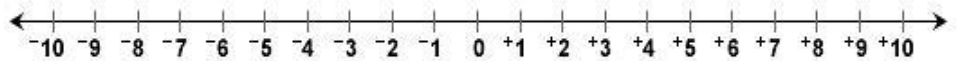
$$A = \{1, 2, 3, 4, 5, 6, 7\} \quad B = \{2, 4, 6, 8\} \quad C = \{7, 8, 9, 10\}$$
$$A \cup B$$

11. Graph the following inequalities on a number line.

a.  $r + 5 \geq -2$  and  $4r - 9 < -1$

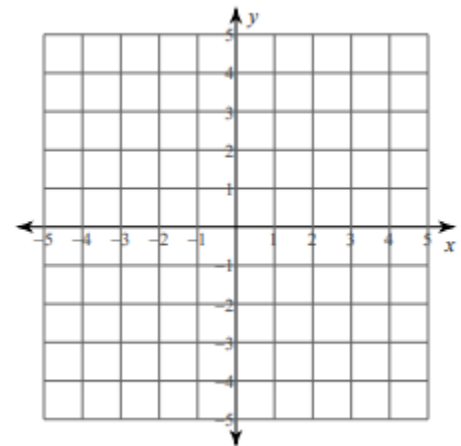


b.  $-10b + 3 \leq -37$  or  $3b - 10 \leq -25$



12. Graph the following system of inequalities

$$y \geq \frac{2}{3}x + 3$$
$$y > -\frac{4}{3}x - 3$$



13. If  $f(x) = x^2 - 1$ ,  $g(x) = 2x - 3$ ,  $h(x) = 1 - 4x$

a.  $(f-g)(x)$

b.  $(f+h)(x)$

c.  $(f \circ g)(x)$

d.  $(g/h)(0)$

e.  $h(g(f(5)))$

14. Identify the vertex, axis of symmetry, y-intercept, x-intercept(s), and opening of the graph of  $x^2 + 16x + 64$

Opens:

Vertex:

Axis of symmetry:

y-intercept:

x-intercept (roots):

15. State if the given functions are inverses.

$$g(x) = 4 - \frac{3}{2}x \text{ and } f(x) = \frac{1}{2}x + \frac{3}{2}$$

16. Find the inverse of the function  $h(x) = 2x^3 + 3$

17. Write the slope-intercept form of the equation of the line through the given points.

a. (-5, 5) and (3, -4)

b. (3, -3) and (0, 5)

18. Write the slope-intercept form of the equation of the line described.

a. through (5, 3), parallel to  $y = -\frac{1}{4}x + 1$

b. through (4, 4), perpendicular to  $y = -\frac{4}{5}x + 5$

19. Solve the system of equations.

a.  $x + 6y = 2$

$$5x + 4y = 36$$

b.  $2m + 4n = 10$

$$3m + 5n = 11$$

c.  $-4x - 5y - z = 18$

$$-2x - 5y - 2z = 12$$

$$-2x + 5y + 2z = 4$$

20. Divide. Write your answer in fraction form if there is a remainder.

a.  $4x^3 - 2x^2 + x - 3$  divided by  $x - 1$

b.  $x^4 + 4x^2 - 45$  divided by  $x^2 + 9$

21. State the possible rational zeros and then find all the rational zeros.

$g(x) = 4x^3 - 9x^2 + 6x - 1$

22. Describe the transformations that map the function  $y = 2x$  onto each of the following function:

a.  $y = 2^x - 2$

b.  $y = 2^{x+3}$

c.  $y = 4^x$

d.  $y = 3(2^{x-1}) + 1$

23. Simplify the following problems as much as possible so that your answer uses only *positive* exponents.

a.  $(2acd)^3(3cda)$

b.  $\frac{1}{(2y^2z)^{-3}}$

c.  $\left(\frac{2vq^6}{qv^3}\right)^{-2}$

d.  $\frac{(5a^2)(6p^3)}{(2a^3)(5^{-1}p)^{-2}}$

e.  $\left(\frac{4x}{2x^5}\right)^3$

f.  $(-k^{-4}m^7)(3k^5m^{-1})(2k^{-2}m)$

24. If \$5000 is invested at 6% annual interest, compounded monthly, how much will you have when you retire in 30 years?

25. Express the equation in Logarithm form  $3^5 = 243$

26. Express the equation in exponential form  $\log_5 X = 2$

27. Evaluate the expression.

a.  $e^{\ln 7}$

b.  $\log_4 (1/256)$

28. Use the rules of logarithms to write the given expression as a single logarithm.

$(\log x + \log (x+3)) - \log (x^2 - 9)$

29. Solve the equation. If needed, round to the nearest hundredth.

a.  $3^x = 5$

b.  $4^{3x-1} = 3^{x-2}$

c.  $\ln (3x-5) = \ln 11 + \ln 2$

d.  $\log (3x-1) + \log 2 = \log 4 + \log (x+2)$

30. Find the equation of the circle with the given information.

a. Center (5, -2) diameter = 12

b. Center (-1,-3), passes through (-4, -2)

31. Find the center and radius of the circle with the given equation.

a.  $15x^2 + 15y^2 = 10$

b.  $x^2 + y^2 + 10x - 75 = 0$

32. Find the equation of the ellipse.

a. centered at the origin, foci on the x-axis, x-intercepts  $(\pm 7, 0)$ , y-intercepts  $(0, \pm 2)$

b. major axis  $(6, 9)$  and  $(6, 3)$ , minor axis  $(2, 6)$  and  $(10, 6)$ .

33. Find the equation of the hyperbola centered at the origin that satisfies the given conditions.

a. focus  $(-3, 0)$  and vertex  $(-2, 0)$

b. x-intercepts  $\pm 3$ , asymptote  $y = 2x$

34. Find the equation of the hyperbola:  $9x^2 - 4y^2 - 90x + 32y - 163 = 0$

35. Find the equation of the parabola with vertex at the origin that satisfies the given conditions.  
focus:  $(5, 0)$

36. Find the focus and directrix of the parabola.

a.  $y = 3(x-1)^2 + 2$

b.  $x = -6(y+2)^2 - 4$