

Advanced Algebra II with Statistics Pre-Requisite Summer Packet

Solving Equations

1. If $4x - 8 = 26$, what is the value of $2x - 8$?

Solve the following equations:

2. $3(x - 1) - x = 3 + 2(x - 3)$

3. $2x - \frac{5}{6} = \frac{3}{4}x$

4. $\frac{2}{5}a - \frac{1}{2} = -\frac{1}{2}a + 1$

Solve the following equations for x:

5. $m = \frac{x + n}{p}$

6. $\frac{cx + dx}{a} = g$

7. What value of a makes this equation have a solution of all real numbers? $2x - ax - 15 = a(2x - 3) - 13x$

Linear Functions

8. What is the slope of the line passing through $(-5,9)$ and $(-5,6)$?

9. The graph of $Ax + 3y = -3$ is a line that passes through the point $(2,-5)$. What is the value of A ?

10. Write an equation of a line that is perpendicular to the line $6x - 9y = 45$.

11. Write an equation for the line in slope-intercept form that passes through the points $(-3,-11)$ and $(2,-1)$.

12. Use the table to write an equation of the line in all 3 forms:

x	y
-10	-7
0	-3
5	-1
20	5

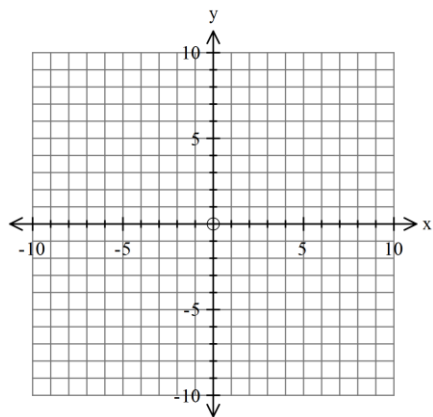
Point-slope: _____

Slope Intercept: _____

Standard: _____

13. Determine the value of k so that the line goes through (k, 6) and (1, 2) and is parallel to the graph of $2x+y=3$.

14. Graph $y = -4x + 6$ on the domain $x \leq 0$. Then find the range of the function.



Range: _____

15. Find the 200th term of the arithmetic sequence 6, 1, -4, -9,

Functions

16. Describe the transformations from $f(x)$ to $h(x)$.

a.) $f(x) = x^2$
 $h(x) = \frac{1}{3}(x - 4)^2$

b.) $f(x) = |x|$
 $h(x) = -|x| + 4$

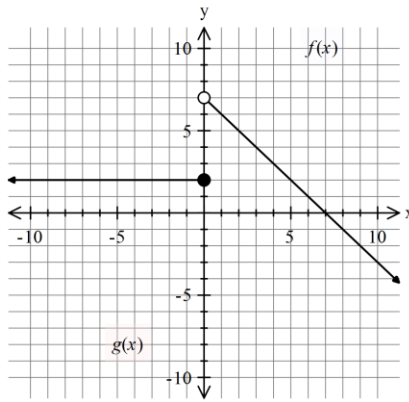
17. If $f(x) = 3x-1$ and $g(x) = 5x$, find:

a.) $f(g(-4))$

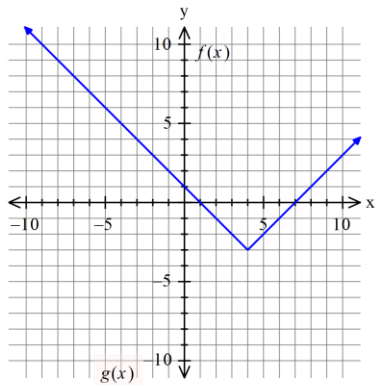
b.) $g(f(1))$

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

18. Given the graph, write a piece-wise function:



19. Given the graph, answer the following questions:



- _____ a.) What are the x-intercept(s) of the function?
- _____ b.) What is the y-intercept of the function?
- _____ c.) What is the minimum value of the function?
- _____ d.) Is $f(x)$ increasing on the interval $x < 4$?
- _____ e.) Is $f(x)$ positive on the interval $x > 4$?

Inequalities

Solve and write the solution in interval notation.

20. $\frac{1}{3} + x + \frac{2}{9} \geq \frac{5}{6}$.

21. $4x + 8 \geq x + 6$ or $7x - 14 \geq 2x - 4$

22. $4y + 3 < y$ and $y - 3 < 2y - 15$

23. $4 \left| x + \frac{1}{3} \right| = 20$

24. $-\frac{1}{3} |6x - 3| \geq -3$

Systems of Equations

25. If $x + y = 5$ and $x + 2y = 10$, what is $x - y$?

26. Solve the system:

$$4y - 3x = 5$$
$$\frac{3}{4}x = y - 4$$

$$4x + 5y = 44$$

27. Solve the system: $3x - 2y = 10$

28. $ax + \frac{1}{4}y = 7$

For what values of a does the system have no solution? _____

$$\frac{1}{3}x + \frac{1}{6}y = 3$$

For what values of a does the system have infinitely many solutions? _____

For what values of a does the system have exactly one solution? _____

Exponents and Exponential Functions

29. Simplify the following. No negative exponents should remain.

a. $(-2)^2(-2)^4$

b. $(-2)(-2)^7$

c. $[(-2)^4]^4$

d. $36^{\frac{3}{2}}$

e. $(-8)^{\frac{2}{3}}$

f. $(81x^6)^{\frac{3}{4}}$

g. $y \cdot y^{x-2} \cdot y^x$

h. $\left(-4x^{\frac{1}{3}}\right)\left(-4x^{\frac{2}{3}}\right)(-4x)^{-2}$

30. Solve for r : $81^{-\frac{3}{4}} = 27^r$

31. If $x^2 \cdot x^2 \cdot x^2 = \frac{x^3 \cdot x^3}{r}$, then $r =$

32. Write an exponential function that represents the data in the table:

x	-2	-1	0	1	2
y	1/9	1/3	1	3	9

33. Write an exponential function that passes through the given points:

x	-2	-1	0	1	2
y	24	12	6	3	3/2

Factoring

Factor the following expressions completely.

34. $3x^2 - 75y^2$

35. $2a^3 + 16a^2 + 30a$

36. $12x^4 + 10x^3 - 12x^2$

37. $1 - 16x^4$

38. $x^4 - 26x^2 + 25$

39. $6x^2 + 9x - 105$

40. Solve for x: $0 = -27x^3 + 9x^2 + 6x$

41. Solve for k if the polynomial is a perfect square trinomial: $4x^2 - 20x + k$

Quadratics

42. What are the x-intercepts of $f(x) = -x^2 + 13x - 36$?

43. What is the vertex of the graph of $y = -2x^2 + 16x - 15$?

44. Solve the quadratic equation: $a^2 + 8a = 18$

45. Solve $\frac{2}{5}(x-4)^2 = 16$. Answer should be exact and in simplest radical form.

46. Solve by completing the square: $x^2 - 10x + 26 = 8$

47. Solve by using the quadratic formula: $2x^2 - 8x = 7$. Answer should be exact and in simplest radical form.

Radicals

48. Simplify $\sqrt{\frac{80w^3}{9}}$

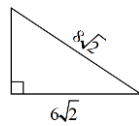
49. Simplify $\frac{7\sqrt{100}}{\sqrt{500}}$

50. Simplify $4\sqrt{7} + 8\sqrt{63}$

51. Simplify $\sqrt{\frac{63x^4}{7xy}}$

52. $(6 - \sqrt{11})(6 + \sqrt{11})$

53. Determine the length of the missing side:



Rational Expressions

Simplify. State any excluded values.

54. $\frac{x^2 - x}{x^2 + x - 2}$

55. $\frac{9a^2 - 25}{2a - 2} \div \frac{6a - 10}{a^2 - 1}$

56. $\frac{9}{5x - 10} + \frac{4}{4x - 8}$