

# Advanced Algebra 2 1<sup>st</sup> semester final review #2 2012+

1. Solve for z:  $M = \frac{x + y - z + w}{7}$

2. What term completes the square for  $x^2 + 10ax$

3. Is this function linearly related?

x	y
-2	3
-6	15
-7	18

4. The values in the table are linearly related. Answer the following questions:

x	y
536	2
646	A
756	10
866	B

a) is A > B ?

b) is B > A ?

c) is A = B ?

d) A + B = ?

5. Write the equation of the line that contains (0,2) and (3,0) in standard form.

6. A is directly proportional to the square root of B. If A=10 when B=25, Find B when A is 4.

7. Find the least squares regression line and use it to estimate the y value when x=10.5 Round to 4 places after the decimal.

x	0	2	3	6	7	9	12
y	14	19	22	26	26	32	38

8. Solve and graph

$$4x + 5 > 1 \quad \text{and} \quad 3 \geq -7 + 2x$$

9. Solve for x  $|3x - 1| \leq 9$

10. Graph  $-5 - 3i$

11. How many solutions does this system

have?  $\begin{cases} y = 3x + 5 \\ -3x + y = 7 \end{cases}$

12.  $|3 - 7i| =$

13. Graph  $y > \frac{3}{4}x - 1$

14. The Lenc family is going to Taco-Shmaco for tacos and sodas. Write an inequality to represent how many sodas they can buy if soda costs \$1.85 each and tacos are \$2.20 each. They only have \$15 to spend.

15. Graph the solution  $\begin{cases} x + 3y > 6 \\ 2x - y \geq 2 \end{cases}$

16. Using Cramer's Rule to solve the following system. What would  $D_z$  be?

$$x + y + z = 5$$

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

$$x + y = 6$$

17. How many solutions does this system

have?  $\begin{cases} 3x + y - 5 = 0 \\ 5x = 2y + 8 \end{cases}$

18. Four shirts and 3 jackets cost \$313. While five jackets and 2 shirts cost \$419. How much does each jacket cost?

19. Find three ordered pairs that satisfy

$$\frac{3}{4}x - \frac{1}{2}y \geq -1$$

20. Find an ordered pair that satisfies this

system.  $\begin{cases} y > -3x - 1 \\ -3x + y \leq 5 \end{cases}$

21. Solve  $k^2 + 625 = 0$

22. What are the zeroes of

$$f(x) = 3x^2 - 13x - 10$$

23. Find the x-intercepts of

$$f(x) = (2 - x)(x + 3)$$

24. Use the quadratic formula to solve.

Round to nearest tenths.  $3x^2 - 4x = 5$

25. Find the sum of the first 100 terms of the series  $20 + 16 + 12 + 8 + \dots$

26. When  $\frac{1 - 3i}{2 + i}$  is put in  $a + bi$  form, what is the value of  $a$ ?

27. How many real solutions are there for

$$x^2 + 3x + 10 = 0$$

28. Find the solution for  $x^2 - 7x \geq 30$

29. Simplify:  $(5 + 6i) - 2(4 - 5i)$

30. Simplify:  $\frac{5 + 3 \cdot 5^3}{3(6 + 2^2) + 4 \cdot 2} - 5^2$

31. Describe the transformation that took place from  $g(x)$  to  $h(x)$  if

$g(x) = x^2$  and  $h(x) = -3(x - 6)^2$

32. Solve  $\frac{2}{3}x - \frac{3}{4} - \frac{3}{8}x = \frac{8}{5}x - 1$

33. For the sequence  $-1, -9, -17, \dots$

- a) Write an explicit definition for the sequence above.
- b) Write a recursive definition for the sequence above.

34. Find  $S_{50}$  for  $5, 11, 17, 23, \dots$

35. Find the 5<sup>th</sup> term for  $\begin{cases} a_1 = 3 \\ a_n = a_{n-1} + 6 \end{cases}$

36. Find the value of  $\sum_{k=1}^{100} 3k^2 - 2k + 2$

37. For the sequence  $-1, 5, -25, 125, \dots$

- a) Write an explicit definition for the sequence above.
- b) Write a recursive definition for the sequence above.

38. Find  $a_{308}$  for an arithmetic sequence with

$a_3 = 6$  and  $a_{14} = 39$

39. Write an explicit formula for  $-10, 15, -22.5, 33.75, \dots$

40.  $f(x) = 2x^2 - 3x$  what is  $f(a + 1)$ ?

41. Write an example of the following properties:

- a) Distributive property
- b) Associative property of Addition
- c) Commutative property of Multiplication
- d) Inverse property of Addition

42. Simplify  $\left(\frac{-2x^{-3}y^5}{3x^4y^0}\right)^3$

43.  $f(x) = 2x + 5$  and  $g(x) = 3x^2 - 1$   
find  $(f \circ g)(-1)$

44. Write an equation of a possible polynomial with roots are  $x = -3, x = 4$

45.  $h(x) = x + 3$  and  $g(x) = (x + 1)^2 - 1$   
find  $(h \circ g)(x)$

46. if  $-3 + 5 + 13 + \dots + 453 = 13050$  find  $n$

47.  $\sum_{i=1}^{200} 3(-1)^{i-1} \approx$

48. Write the equation of the line in slope intercept form that is perpendicular to

$y = \frac{3}{2}x - 4$  and contains  $(-3, 1)$

49. solve:  $-3(y - 7) + 3 = 3y - (y + 1)$

50. solve:  $|5x - 10| = 20$

51. solve:  $\frac{3}{m+1} = \frac{7}{2m+3}$

52. solve:  $|3x - 7| > 13$

53. Write a quintic binomial

54. Simplify and give in standard form:

$(3x^2 - 4x^5 + 3x^3 - 4) - 2(5x^4 + x - 2x^3 + 3)$

55. Simplify and give in standard form:

$(x - 4)(x + 1)^2$

56. Find  $P(-15)$  if

$P(x) = \frac{1}{5}x^3 + \frac{2}{15}x^2 - 4x + 5$

57. Factor completely:  $27y^3 - 64$

58. Find the quotient when

$3x^3 + 11x^2 + 5x - 3$  is divided by  $x + 3$

59. Find the quotient when

$2x^5 + 9x^4 - 4x^3 - x^2 + 11x - 10$  is divided by  $2x^2 + x - 2$

**60. What are the possible polynomial factors of the graph:**

**61. Find all the solutions.**

$$5x^3 - 2x^2 + 4x - 7 = 0$$

**62. What is the zero(es) of this graph?**

**63. Find all the zeroes of  $f(x)$  if**

$$f(x) = x^3 + 4x^2 - 2x - 5$$

**64. If when  $P(x) = 0$  one root is  $3+8i$  what must another root be?**

**65. What is the set of all possible rational roots for  $f(x) = x^4 - 3x^3 + 5x^2 + 6x - 12$**

**66. Find the remainder when  $3x^2 - 2x + 6$  is divided by  $x + 3$**

**67. Find all the roots of**

$$f(x) = x^3 + x^2 - 5x - 5$$

**68. Use synthetic division to show if  $x + 3$  is a factor of  $x^3 - 3x^2 + 9$**

**69. Simplify:**

$$(2x^5 - 3x^4) + (2x^2 - 8) - (3x^2 - x + 9)$$