# Algebra 2 CP Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Midterm Review**

**Chapter 3**

***Solve the system by graphing.***

1. 2x + y = - 6 2. 3y = x + 6

 3y = x + 3 2x – 6y = -12

Solution:\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Solution:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Solve the system by substitution.***

3. x = 5y 4. y – 2x = -7 5. x – 6y = 4

 2x + 5y = 15 3x – 4y = 8 3x – 18y = 4

***Solve the system by elimination.***

6. x – 2y = 6 7. 9x – 15y = 24 8. x + 2y = 5

 x + 2y = 4 6x – 10y = 16 -3x + 6y = 15

9. The sum of two numbers is 20. Their difference is 4. What are the two numbers?

10. You will be making hanging flower baskets. The plants you have picked out are petunias and daisies. The petunias cost $3.00 each and the daisies cost $1.50 each. You bought a total of 24 plants for $48.00. How many of each type of plant did you buy?

11. The perimeter of a rectangular garden is 104 ft. The length of the garden is 8 less than twice the width. What are the dimensions of the garden?

12. Stan bought 3 boxes of Froot Loops and 2 boxes of Kix for $15.05. One box of Froot Loops cost $0.60 more than one box of Kix. How much does one box of each type of cereal cost?

**Midterm Review – Chapter 4**

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Add or subtract the following polynomials. (Distribute if necessary, and then combine like terms)

### 1.  2.  3.

### *Multiply the following polynomials. Use distribution or FOIL*

4.  5.  6. 

7.  8.  9. 

# True or false?

10.  11. 

12. 

#### Factor the following polynomials. Look for the greatest common factor, difference of squares, trinomials, and sum/difference of cubes – these will be in your chapter 5 notes!!!

13.  14.  15. 

#### Factor the following polynomials. Look for the greatest common factor, difference of squares, trinomials, and sum/difference of cubes – these will be in your chapter 5 notes!!!

16.  17.  18. 

19.  20.  21. 

22.  23.  24. 

***Solve by factoring***

25.  26.  27. 

***Simplify.***

28.  29.  30. 

31.  32.  33. 

***Simplify.***

34.  35. 

## *Fill in the blanks to complete the square.*

36.  37. 

38. 

***Solve by completing the square***

39.  40.  41. 

***Write each quadratic function in vertex form by COMPLETING THE SQUARE. Identify the vertex, axis of symmetry and direction of opening.***

42.  43. 

# Find the value of the disciminant and determine the nature of the roots.

# Choices: 2 real roots, 1 real root, 2 complex roots

44.  45.  46. 

Disc = \_\_\_\_\_\_\_\_\_\_ Disc = \_\_\_\_\_\_\_\_\_\_ Disc = \_\_\_\_\_\_\_\_\_\_

Nature of roots \_\_\_\_\_\_\_\_\_ Nature of roots \_\_\_\_\_\_\_\_\_ Nature of roots \_\_\_\_\_\_\_\_\_

***Solve using the quadratic formula.***

47.  48. 

***Calculate the Axis of Symmetry and Vertex by hand, then graph the function. Also, state the domain and range.***

49.  50. 

***Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

51. If $y=ax^{2}+bx+c$ opens up and has no real zeros, what must be true about *a* and *c*?

***Define a variable, write an equation and solve.***

52. A sports team sells about 100 coupon books for $30 each during its annual fund-raiser. They estimate that for each $0.50 decrease in the price, they will sell about 10 more coupon books. How much should they charge for each book in order to maximize the income from their sales? What is the maximum monthly income the team can expect to make from these items?

53. The sum of two numbers is -1, and their product is -6. Write a quadratic equation to find the two numbers, then solve.

54. A rectangular parking lot measures 8 m by 4 m. You want to triple it’s area by adding the same distance *x* to the length and the width. Write and solve an equation to find the value of *x*. What are the new dimensions of the parking lot?

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**Midterm Review – Chapter 5**

***Simplify. Answer all questions using positive exponents!***

1.  2.  3. 

4.  5.  6. 

7.  8.  9. 

10.  11.  12. 

***Divide the following polynomials using synthetic division***

13**. ** 14. ****

***Divide the following polynomials using Long Division***

15.  16. 

***Use direct substitution to find  and  for each function***

17.  18. 

***Find  and  for each function using synthetic substitution.***

19.  20. 

***Given a polynomial and one of its factors, find the remaining factors of the polynomial.***

21. ;  22. ; 

***Solve each equation by factoring. Then, state the number and types of roots.***

23.  24.  25. 

***List all the possible rational zeros of each function.***

26.  27. 

***Find all of the zeros of each function.***

28.  29. 

***Describe the end behavior for each.***

30.  31. 

****  ****

*** ***

***Find the zeros, relative minimum(s) and relative maximum(s) and graph the following. Also state the domain and range.***

32.  33. 

Zeros: Zeros:

Mins: Mins:

Maxs: Maxs:

Domain: Domain:

Range: Range:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***x*** |  |  |  |  |  |  |  |
| ***y*** |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***x*** |  |  |  |  |  |  |  |
| ***y*** |  |  |  |  |  |  |  |

34.  35. 

Zeros: Zeros:

Mins: Mins:

Maxs: Maxs:

Domain: Domain:

Range: Range:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***x*** |  |  |  |  |  |  |  |
| ***y*** |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***x*** |  |  |  |  |  |  |  |
| ***y*** |  |  |  |  |  |  |  |

36. The weight *w,* in pounds, of a patient during a 7-week illness is modeled by the cubic equation:
 , where *n* is the number of weeks since the patient became ill.

1. Graph the equation, and describe the turning points of the

graph and its end behavior.

1. What trends in the patient’s weight does the graph suggest?

Is it reasonable to assume the trend will continue indefinitely?

37. The rainfall *r*, in inches per month, during a 7-month period is modeled by the equation:
 , where *m* is the number of months after March 1.

1. Graph the equation, and describe the turning points

of the graph and its end behavior.

1. What trends in the amount of rainfall received by the town

 does the graph suggest?

***Use FOIL to write an equation with the following roots.***

38. 3 and 5 39. -4*i* and 2 40. and 

**Midterm Review – Chapter 6**

# Simplify.

1.  2.  3. 

4.  5.  6. 

7.  8.  9. 

10.  11.  12. 

***Rationalize the denominator.***

13.  14.  15. 

***Express the following using rational exponents.***

16.  17.  18. 

***Express the following in simplest radical form. No decimal answers.***

19.  20.  21. 

22.  23.  24. 

25.  26.  27. 

28.  29.  30. 

***Solve Each Equation.***

31. $m^{2}-20=0$ 32.  33. 

34.  35.  36. 

***Solve the following equations.***

37.  38.  39. 

40.  41.  42. 

***Find the inverse of each function. Then graph the function and its inverse.***

43.  44.  45. 

***Verify that each pair of functions are inverse functions. You must use the proof method demonstrated in class.***

46.  47. 

***Find the inverse.***

48.  49. 

***Given and find the following and state the domain.***

50.  51. 

52.  53. 

54.  55. 

56. 

***Given and  find the following and state the domain.***

57.  58.  59. 

60.  61. 

**Midterm Review – Chapter 11**

1. Of the 42 employees at Speedy Pizza, sixteen make $4.75 an hour, four earn $5.50 an hour, three earn $6.85 an hour, six earn $4.85 an hour and thirteen earn $5.25 an hour. Find the mean, median and mode of the hourly wages.

 Mean: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Median: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Mode: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Given the following set of data:

|  |  |
| --- | --- |
| Stem | Leaf |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

 32, 45, 67, 93, 82, 55, 58, 45, 13, 54

1. Make a stem and leaf plot of this data.

 b) What is the minimum? b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c) What is the maximum? c) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 d) What is the range? d) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 e) What is the mean? (to nearest tenth) e) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 f) What is the mode? f) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g) What is the median? g) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) 323 people were surveyed. 46% responded that they did use e-mail.

 a) What is the margin of error for this survey? a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b) Give an interval that is likely to contain the exact percentage of people. b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c) If we wanted a margin of error of ± 5%, what would the c) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 sample size need to be?

4. Below are the weights of 14 people boarding a sailboat.

 **134, 167, 137, 138, 120, 134, 145, 155, 152, 159, 164, 135, 144, 156**

 a. What is the mean weight? a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. What is the standard deviation of the weights? b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c. Construct a normal distribution of the weights.

 d. Between what 2 numbers does 68% of the data lie? d) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 e. Between what 2 numbers does 95% of the data lie? e) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f. Above what number can we find weights that are 3 or more standard f) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

deviations above of the mean?