Summer Work Prior to Geometry

A student entering into Geometry at Porter-Gaud School is expected to:

    - keep an organized notebook

    - complete every homework assignment to the best of one's ability

    - be an active learner by following along and taking detailed notes

    - ask questions and participate in class on a daily basis

    - seek help outside of class if needed

    - respectfully work with classmates and the teacher

    - work with and without a calculator

Purpose:

This summer work has been designed to provide a review of Algebra skills that are essential for a student's success in Geometry. These topics will not be retaught during the year. It is strongly recommended that this work be completed gradually over the summer.

Directions:

All work must be shown neatly in order to receive full credit, and it should be done in pencil. The assignment is divided into six sections, and outside resources (notes, books, internet sources, tutors, etc…) may be used to help with completion of it. However, a calculator should not be used. This assignment is due on the first day of class. It will be graded for accuracy, and the grade will count for five homework assignments. The assignment will be reviewed, and a quiz/test will be given.

Online Resources:

- http://www.algebrahelp.com/ offers assistance on various algebra topics
- https://www.khanacademy.org/ click on algebra and there are lessons on various algebra topics that are followed by practice problems

<u>Topics Covered in this Assignment</u>

I. Solving Linear Equations

      -combine like terms

      -get the variable alone on one side of the equation

II. Multiplying Expressions and Binomials

      -when you multiply the same variable, you add the exponents

      -when you multiply two binomials, you can use "FOIL"

III. Factoring

      -factor out the GCF (greatest common factor)

      -factor a trinomial into two binomials

      -factor by grouping

      -factor using the difference of squares pattern

IV. Solving Simple Quadratic Equations

      -can get the quadratic term alone and take the square root of both sides

      -can factor if set equal to zero and then set each factor equal to zero

V. Simplifying Radical Expressions

      -you can "separate" a root over multiplication or division

      -find perfect squares to help simplify the number

VI. Pythagorean Theorem

      -can only use with a right triangle

      - $a^2 + b^2 = c^2$

VII. Problem Solving

      -These word problems involve a variety of skills

      -Answer all questions completely

Part I. Solve each equation for the variable.

1. $5x - 7 = 8$

2. $2x + 3 = -9$

3. $4x - 5 = -12$

4. $-5x + 23 = 8$

5. $3(2x + 1) = -9$

6. $5 - 2x = 12 - x$

7. $(5 + x)2 = 4(x - 3)$

8. $2x + 4(3 + x) = 7x - 4$

9. $-5(2x + 3) + 7x = x - 1$

10. $\dfrac{2}{3}x + 4 = 10$

11. $\dfrac{x-1}{7} = \dfrac{x+3}{2}$

12. $\dfrac{x+5}{4} = \dfrac{3}{8}$

13. $\dfrac{2x-1}{4} = \dfrac{x+3}{2}$

14. $\dfrac{2x-3}{4} = -\dfrac{2}{3}$

15. $\dfrac{2x-1}{4} = \dfrac{x+1}{5}$

16. $\dfrac{2}{3} = \dfrac{x+3}{x-2}$

Part II. Multiply the following and simplify your answers.

17. $2x(3x + 4)$

18. $3x^2(4x^2 + 5x - 2)$

19. $5((4x - 3y)$

20. $(x + 7)(x - 5)$

21. $(2x - 7)(x + 4)$

22. $(x + 2)^2$

23. $(x + 2)(x + 5)$

24. $(3x + 1)(2x + 1)$

25. $(3x + 1)(2x - 3)$

26. $(x - 5)(x - 2)$

27. $(x-3)(x+4)$

28. $(x+5)(x-5)$

29. $(2x-3)(x-3)$

30. $(x+5)^2$

31. $(x-4)^2$

32. $(3x-4)(3x+4)$

33. $(5x-3)(2x-5)$

34. $(3x-4)^2$

Part III. Factor the following.

35. $x^2 + 6x + 8$

36. $x^2 - 10x + 25$

37. $x^2 + 5x + 6$

38. $x^2 + 15x - 16$

39. $x^2 - 2x - 8$

40. $x^2 - 49$

41. $x^2 - 7x + 12$

42. $x^2 - 2x - 15$

43. $x^2 + 3x - 10$

44. $3x^2 - 10x + 8$

45. $3x^2 + 2x - 8$

46. $25x^2 - 36$

Part IV. Solve each equation for the variable.

47. $x^2 = -6x$

48. $x^2 - x - 6 = 0$

49. $x^2 - 25 = 0$

50. $x^2 + 5x + 6 = 0$

51. $x^2 + 5x = 6$

52. $4x^2 - 16x = 0$

53. $x^2 - 12 = 4x$

54. $2x^2 + 11x = -12$

55. $2x^2 - 5x = 12$

Part V. Simplify each radical as much as possible.

56. $\sqrt{25}$

57. $-\sqrt{36}$

58. $\sqrt{64}$

59. $\sqrt{24}$

60. $\sqrt{40}$

61. $\sqrt{18}$

62. $\sqrt{75}$

63. $\sqrt{\dfrac{4}{9}}$

64. $-\sqrt{\dfrac{16}{25}}$

65. $\sqrt{\dfrac{40}{25}}$

66. $\left(3\sqrt{2}\right)\left(5\sqrt{2}\right)$

67. $\dfrac{4}{\sqrt{2}}$

Part VI. Find the missing side of each right triangle, where lengths a and b are the legs, and c is the hypotenuse.

68. a = 10 and b = 12

69. b = 6 and c = 12

70. a = 5 and b = 15

71. a = 6 and b = 9

72. a = 8 and b = 15

Part VII. Answer each problem completely.

73. Kelly telephoned Brooke about a homework problem. Kelly said, "Four plus three times two is 14, isn't it?" Brooke replied, "No, it's 10." Did someone make a mistake? Can you explain where these two answers come from?

74. On a recent game show episode, a contestant was asked to arrange the following five numbers in increasing order. You try it, too.

      (a) 2/3   (b) 0.6666   (c) 3/5   (d) 0.666   (e) 0.67

75. Before you are able to take a bite of your new chocolate bar, your friend comes along and takes 1/4 of the bar. Then another friend comes along and you give this person 1/3 of what you have left. Make a diagram that shows the part of the bar left for you to eat.

76. Later you have another chocolate bar. This time, after you give away 1/3 of the bar, a friend breaks off 3/4 of the remaining piece. What part of the original chocolate bar do you have left? Answer this question by drawing a diagram.

77. Jess took a board that is 50 inches long and cuts it into two pieces, one of which is 16 inches longer than the other. How long is each piece?

78. A group of ten persons were planning to contribute equal amounts of money to buy some pizza. After the pizza was ordered, one person left. Each of the other nine persons had to pay 60 cents extra as a result. How much was the total bill?

79. Jack has just finished telling Lee about learning a wonderful new algebra trick: 3+5x can be simplified very neatly to just 8x because a+bx is the same as (a+b)x. Now Lee has to break some bad news to Jack. What is it?

80. Solve $9x + 2 = \frac{3}{4}(2x + 11)$.