Immaculate Heart Academy
SUMMER ASSIGNMENT

You are taking **Geometry Honors (5230)** in the fall. A mastery of and proficiency performing the following Algebra skills will be necessary for success in your **Geometry course**. Work on each problem in order. Show all work in a neat and organized manner. Circle your final answer. ***Complete this entire assignment and bring to class on the first day.***

This assignment is mandatory and must be completed in neat and orderly manner. You will be given a proficiency test within the first week of school on the topics in this assignment. This test will be counted toward your first quarter grade.

At the end of this assignment are several links to websites that you might find helpful should you have any problems with your assignments.

Name: _____ Date: _____

Last Math Class Taken:_____

Teacher: _____

Immaculate Heart Academy - Geometry Summer Assignment

Complete the following problems on separate paper and show all supporting work for the solution. Circle your answer. This assignment will be due the first day of class.

Perform the indicated operation. Leave your answer as an improper fraction.

1. $6-\frac{1}{6}$

2. $\left(-\frac{4}{5}\right)-\frac{7}{8}$

3. $\frac{1}{3}-\left(-\frac{5}{3}\right)$

4. $\left(-\frac{10}{7}\right)+\frac{1}{6}$

5. $\frac{9}{5}+\left(-\frac{4}{3}\right)$

6. $3\frac{6}{7}+\left(-1\frac{1}{7}\right)$

7. $2\frac{1}{3}+\left(-1\frac{2}{3}\right)$

8. $-\frac{2}{3}\cdot\frac{5}{4}$

9. $-2\frac{2}{3}\cdot 4\frac{1}{10}$

10. $-2\frac{1}{5}\cdot -1\frac{3}{4}$

11. $-2\frac{3}{8}\cdot 2\frac{1}{2}$

12. $\frac{-3}{2}\div\frac{-10}{7}$

13. $\frac{-9}{5}\div 2$

14. $\frac{1}{9}\div -1\frac{1}{3}$

15. $1\frac{6}{7}\div 5\frac{3}{4}$

Evaluate the expressions using x=4 and y=-5

16. $3x+4y$

17. $4x^2y^2+y^2$

18. $x+4y-2x^2y$

Solve:

19. -11 + 4x = 25

20. 7 – 3x = -10

21. 2x – 15 + x = 9

22. 7x – 90 = 120 + x

23. 22 – 13x = -8 - 2x – 18x

24. 8x + 8 = x + 1

25. -2(x + 3) = 6

26. 6(x – 4) + 5 = 11

27. -2(14x + 5) = -8

28. x – 5 = 3 – 5x + 3x + 4

29. $\frac{1}{3}(x-15)=-1$

30. $-\frac{3}{4}(x+12)=-3$

Solve each proportion.

31. $\frac{10}{4}=\frac{x+8}{8}$

32. $\frac{10}{8}=\frac{x-9}{9}$

33. $\frac{6}{10}=\frac{x-2}{6}$

Solve each inequality and graph on the number line.

34. $13\le -\frac{x}{3}$

35. $-x+6>-(2x+6)$

36. $-2(x+3)<4x-7$

Multiply the polynomials. Show all steps.

37. $(x+4)(3x+5)$

38. $(x-5)(2x^2-x-8)$

39. $(2x-4)(x^2+3x+2)$

Factor the following:

40. $x^2-10x+21$

41. $a^2+5a-50$

42. $n^2-7n-30$

43. $2x^2-7x+3$

44. $6x^2-x-5$

45. x^2-100

Solve the following quadratic equations:

46. $x^2-5x+6=0$

47. $x^2-x=12$

48. $2x^2+3x=2$

49. $2x^2=3x+2$

50. $x^2-25=0$

51. $2x^2-18=0$

52. $x^2=6x+7$

53. $4x^2+11x-3=0$

54. $81c^2-4=0$

Simplify the following:

55. $(6x)^3$

56. $x(x-x^2)$

57. $-(3a)^3(2a)^2$

58. $\left(-3r^3s\right)^3\left(-2s^2\right)^2$

59. $\dfrac{x^3}{x^{-2}}$

60. $\dfrac{4}{4x^{-2}x^5}$

Solve using linear combination/elimination.

61. $\begin{cases} 2x+y=5 \\ x-y=1 \end{cases}$

62. $\begin{cases} 4x-5y=22 \\ 3x-y=11 \end{cases}$

63. $\begin{cases} 9x-8y=4 \\ 2x-3y=-4 \end{cases}$

Solve using substitution.

64. $\begin{cases} y=2x-1 \\ 2x+y=3 \end{cases}$

65. $\begin{cases} x=y+3 \\ 2x-y=5 \end{cases}$

66. $\begin{cases} 11x-7y=-14 \\ x=2y-4 \end{cases}$

Calculate the slope of the line containing the pairs of points. You may leave answer as an improper fraction, but it should be in lowest terms.

67. (3, 8) and (0, 4)

68. (-1, 2) and (6, 5)

69. (-4, -1) and (9, -3)

Use graph paper to graph the following equations. Use a ruler.

70. $y=-x+3$

71. $y=-2x-5$

72. $y+\dfrac{2}{3}x=1$

73. $y-\dfrac{7}{2}x=0$

Find the slope of a line parallel to each given line.

74. $y=\dfrac{3}{5}x$

75. $-3x+y=5$

76. $2x+3y=6$

Find the slope of a line perpendicular to each given line.

77. $y=-3x-1$

78. $y=-3$

79. $6x-y=-1$

80. Write the equation of a line that passes through (5,6) and (-1,3).

81. Write the equation of a line that passes through (2,3) with a slope of -5.

82. Write the equation of a line that passes through (-4,-1) and is perpendicular to the graph of $y = -2x + 4$

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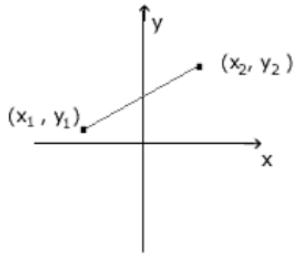
DISTANCE FORMULA

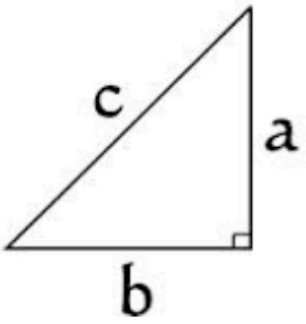
x_2 and y_2 are the x,y coordinates for one point
x_1 and y_1 are the x,y coordinates for the second point
d is the distance between the two points

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



PYTHAGOREAN THEOREM

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



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Use the Distance Formula to find the length between two points in problem 83 and 84.

83. (2, 5), (-1, 1)

84. (1, 5), (1, 0)

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Mid-point Formula

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

Find the coordinates of M, the midpoint of $\overline{ST}$, for $S(-6, 3)$ and $T(1, 0)$.

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$
$$= \left(\frac{-6 + 1}{2}, \frac{3 + 0}{2}\right)$$
$$= \left(\frac{-5}{2}, \frac{3}{2}\right) \text{ or } M\left(-2\frac{1}{2}, 1\frac{1}{2}\right)$$

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Find the midpoint of the line segment with given endpoints.

85. (-4, 6), (-3, 6)

86. (1, -1), (-6, 1)

Given the midpoint and one endpoint of a line segment, find the other endpoint.

87. Endpoint: (5, -5), midpoint: (-3, -1)

88. Endpoint: (1, 3), midpoint: (-2, 3)

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Simplify the radical.

Example:

$$\begin{aligned}\sqrt{27} &= \sqrt{9 \cdot 3} \\ &= \sqrt{9} \cdot \sqrt{3} \\ &= 3\sqrt{3}\end{aligned}$$

89. $\sqrt{24}$

90. $\sqrt{200}$

91. $\sqrt{125}$

92. $\sqrt{48}$

93. $\sqrt{363}$

94. $\sqrt{240}$

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Simplify a radical with an irrational denominator.

Example 1

Simplify

$$\frac{2}{\sqrt{3}}$$

$$\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$$\frac{2 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}}$$

Example 2

Simplify

$$\sqrt{\frac{5}{8}}$$

$$\frac{\sqrt{5}}{\sqrt{8}}$$

$$\frac{\sqrt{5}}{\sqrt{8}} \cdot \frac{\sqrt{8}}{\sqrt{8}}$$

Remember to rationalize the denominator, multiply the numerator and denominator by the radical you want to eliminate

$\frac{2\sqrt{3}}{(\sqrt{3})^2}$ $\quad$ $\frac{\sqrt{40}}{8}$ $\quad$ Simplify the radical

$\frac{2\sqrt{3}}{3}$ $\quad$ $\frac{2\sqrt{10}}{8}$

$\frac{\sqrt{10}}{4}$

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95. $\frac{3}{\sqrt{5}}$ $\quad$ 96. $\frac{4}{\sqrt{6}}$ $\quad$ 97. $\frac{1}{\sqrt{7}}$

98. $\sqrt{\frac{3}{8}}$ $\quad$ 99. $\sqrt{\frac{2}{3}}$ $\quad$ 100. $\sqrt{\frac{1}{9}}$

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1. https://www.mathsisfun.com/algebra/factoring.html
2. http://www.coolmath.com/algebra/08-lines/06-finding-slope-line-given-two-points-01
3. http://mathforum.org/dr.math/