St. Agnes Academy

Geometry Summer Packet

Geometry Summer Work Packet

This workbook contains problems designed to ensure the student's readiness for Geometry. The ten topics covered in this packet are concepts that should be mastered before entering Geometry. It is strongly recommended that calculators **NOT** be used to complete the following problems since the objective of this packet is to verify the student's understanding of the concepts.

Topics Covered in this Packet:

1. Order of Operations x

2. Fractions

3. Exponents

4. Radicals

5. Simplifying Expressions

6. Solving Equations

7. Solving Inequalities

8. Linear Graphs

9. Multiplying, Factoring and Solving Polynomial Expressions and   Equations

10. Solving Systems of Equations

Name: _____

Please place all answers on the answer sheet. Please do not use a calculator to complete this packet.

A. Order of Operations

Evaluate each expression. Write your answer in simplest form.

1. $2^2 \cdot 2 + \left[8 - \left(4^2 - 5 \right) \right]$

2. $\left[15(10) - 8(10) \right] \div 10$

3. $(8-2)(12-3)\left(\dfrac{1}{2} \right)\left[4 + 1(2) \right]$

4. $-4\left[(3 + 2 \times 3) - 5 \right] + 10$

5. $80 \div 4 \times 3 - 2 \times 8$

6. $3^2 + 7 \times 2 - 8 \times 2$

B. Fractions

Evaluate each expression. Write your answer in simplest form. Where applicable, leave answers as improper fractions. (Reduce, reduce, and reduce!)

7. $\dfrac{1}{3}\left(\dfrac{5}{6} - \dfrac{3}{4} + \dfrac{2}{3} \right)$

8. $\dfrac{\dfrac{3}{9} - \dfrac{8}{12}}{\dfrac{3}{8} \cdot 2}$

9. $-\dfrac{4}{9} \cdot \dfrac{3}{2} - \dfrac{5}{6} + 3$

10. $\left(4 - \dfrac{5}{6} + 3 \times 2 \right) \div \dfrac{5}{6}$

11. $\dfrac{\dfrac{2}{3} + 4}{\dfrac{5}{6}}$

12. $\dfrac{\dfrac{3}{2} + \dfrac{3}{4} + \dfrac{3}{8}}{21}$

C. Exponents

Simplify each expression. Write your answer in simplest form. Where applicable, leave answers as improper fractions. The simplified expression should have no negative exponents.

13. $\dfrac{4x^8}{6x^{-5}}$

14. $\left(6xy^2 \right)\left(-8x + 9y \right)$

15. $\left(3x \cdot x^3 \right)^{-2}$

16. $\dfrac{x^2 y}{3y^3 x^3} \cdot \dfrac{18x^4 y^2}{xy^6}$

17. $\left(12xy \right)^0 \left(x^2 y^4 \right)^5$

18. $\dfrac{2x^{-2} y}{3y^{-3} x^2} \cdot \dfrac{3x^4}{8y^{-2}}$

D.   Radicals

Write each answer in simplest radical form. Answers should not be in decimals!

19. $\sqrt{36}$ 20. $\sqrt{45}$ 21. $\sqrt{24}\cdot\sqrt{54}$

22. $\dfrac{\sqrt{112}}{\sqrt{14}}$ 23. $\sqrt{\dfrac{48}{5}}$ 24. $\sqrt{\dfrac{10}{25}}\cdot\sqrt{72}\cdot5\sqrt{\dfrac{98}{36}}$

E.   Simplifying Expressions

Simplify each expression. Write your answer in simplest form.

25. $\left(2y^3 9 - y + 16\right) - \left(5y^3 + 3y - 3\right)$ 26. $-7x + 8(-2x + 5)$

27. $4y(2 - y) + 3y^2$ 28. $5(x + y) - 4(3x - 2y + 1)$

29. $\dfrac{30x^2 + 20x - 10}{-5}$ 30. $\dfrac{6x^4 + 27x^5 + 3x^4 + 3x^5}{3x^3}$

F.   Solving Equations

Solve each of the following equations for x.

31. $3 - 2(x - 1) = 2 + 4x$ 32. $8x - 4 + 3(x + 7) = 6x - 3(x - 3)$

33. $16x - 3(4x + 7) = 6x - (2x + 21)$

34. $x - 3 - 5(x + 7) = 10(x + 3) - (7x + 5)$

35. $-6x^2 = -216$ 36. $\dfrac{2}{3} = \dfrac{x + 7}{3x}$

37. $\dfrac{x + 6}{4} = \dfrac{4x}{16}$ 38. $16x + 24 = 7(x + 6)$

Solve each equation for the indicated variable.

39. $ax + r = 7$, for x

40. $y = 3x + 3b$, for b

41. $y = mx + 6$, for m

G.   Solving Inequalities

Solve each of the following inequalities for x.

42. $4x + 7 - x \le 31$

43. $4x + 5 \ge x + 26$

44. $2(x-3) + 8x \le 11$

Solve each of the following compound inequalities for x.

45. $-7 \le 3x + 2 \le 8$

46. $-2 \le 4x + 6 < 22$

47. $8 < 3x - 1 \le 11$

H.   Linear Graphs

Given two points M & N on the coordinate plane, find the slope of $\overleftrightarrow{MN}$, and state the slope of the line perpendicular to $\overleftrightarrow{MN}$.

48. M(9,6), N(1,4)

49. M(-2,2), N(4, -4)

50. M(-9,16), N(-11,16)

Find the x-intercept and y-intercept of the given line. Using the intercepts, graph the line.

51. $y = x - 5$

52. $6x + 2y = -12$

53. $3y = 9x + 15$

54. $y = -2x + 1$

55. $y - 10 = 2(x - 4)$

56. $6x - 5 = 2y + 3$

Find the slope and y-intercept of the graph of the equation. Using slope-intercept form, graph the line.

57. $y - 2x = 7$

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

59. $3x + 6y = 12$

I. Multiplying, Factoring and Solving Polynomial Expressions and Equations

Use the FOIL method to find each product.

60. $(3x-2)(x-1)$

61. $(2x-9)(3x-8)$

62. $(3x-5)^2$

Find the greatest common factor and factor it out of the expression.

63. $-4x^3-20x^2+16x$

64. $3x^5y^2-21x^2y^7$

65. $15x^5-10x^4+5x^2$

Factor each expression completely.

66. x^2-25

67. x^2+2x-8

68. $x^2-2x-24$

69. $9x^2-81$

70. $4x^2+8x-21$

71. $2x^3+4x^2-6x$

Using the Zero Product Property, solve the following quadratic equations for x.

72. $x^2=25$

73. $3x^2=48$

74. $x^2-9x-36=0$

75. $x^2-3x+2=0$

76. $2x^2-15x-8=0$

77. $5x^2-17x+6=0$

Using the Quadratic Formula, solve the following quadratic equations.

78. $x^2-2x+9=0$

79. $4x^2-5x-4=0$

80. $6x^2-7x-3=0$

J.   Solving Systems of Equations

Solve the following systems by graphing.

81. $\begin{array}{l} y=-x \\ y=x-2 \end{array}$

82. $\begin{array}{l} y=-2x-4 \\ y=-2x-1 \end{array}$

83. $\begin{array}{l} -x+y=-8 \\ 2x+y=4 \end{array}$

Solve the following systems using substitution.

84. $\begin{array}{l} y=x+3 \\ 3x-3y=-9 \end{array}$

85. $\begin{array}{l} 3x+2y=8 \\ x+4y=-4 \end{array}$

86. $\begin{array}{l} x-2y=-13 \\ y=-2x-6 \end{array}$

Solve the following systems using linear combinations.

87. $\begin{array}{l} 4x+y=2 \\ x-y=-17 \end{array}$

88. $\begin{array}{l} 4x-3y=11 \\ 3x+2y=-13 \end{array}$

89. $\begin{array}{l} 5x+2y=5 \\ 3x+y=2 \end{array}$

Name:_____

Please place all answers on this answer sheet. Problems that require graphs should be done on the included grids on the next pages.

1. _____	21. _____	41. _____
2. _____	22. _____	42. _____
3. _____	23. _____	43. _____
4. _____	24. _____	44. _____
5. _____	25. _____	45. _____
6. _____	26. _____	46. _____
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		52. **ON GRAPH PAGE**
12. _____	32. _____	53. **ON GRAPH PAGE**
		54. **ON GRAPH PAGE**
13. _____	33. _____	55. **ON GRAPH PAGE**
		56. **ON GRAPH PAGE**
14. _____	34. _____	57. **ON GRAPH PAGE**
		58. **ON GRAPH PAGE**
15. _____	35. _____	59. **ON GRAPH PAGE**
16. _____	36. _____	60. _____
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GRAPH PAGE:

51.

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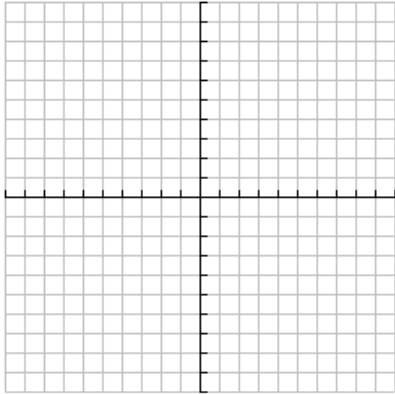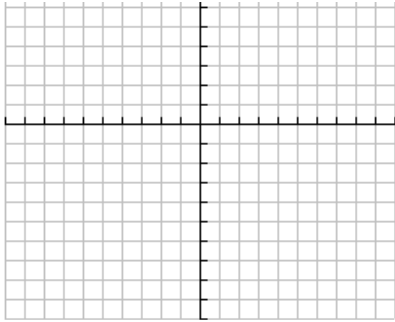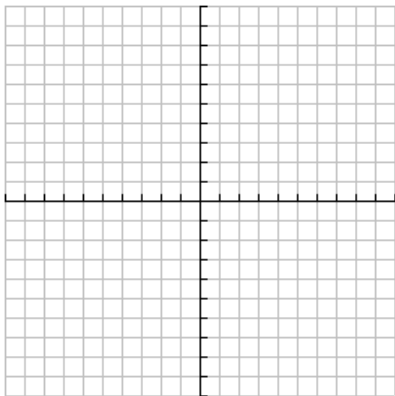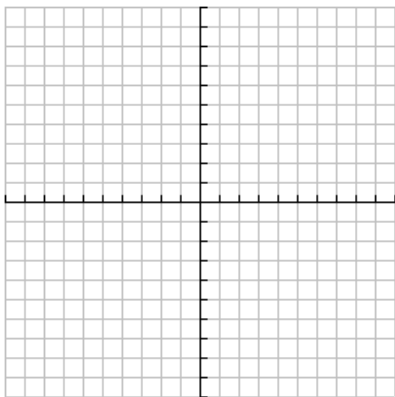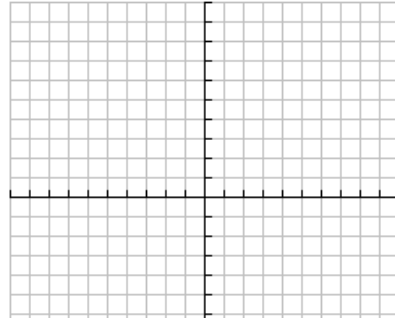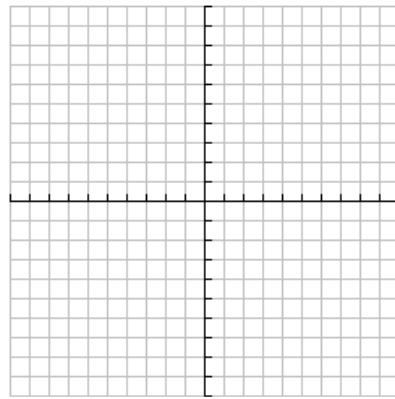
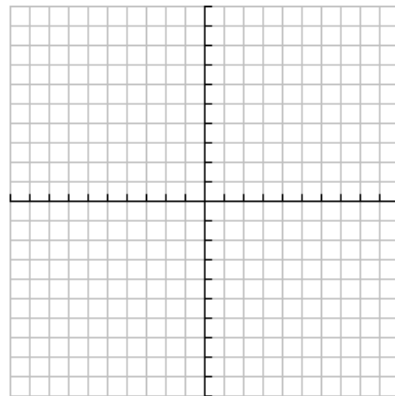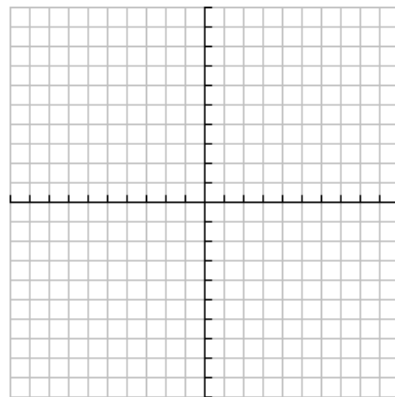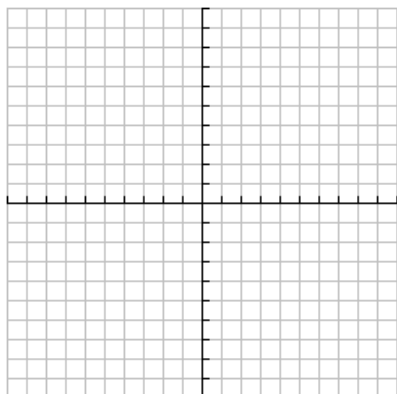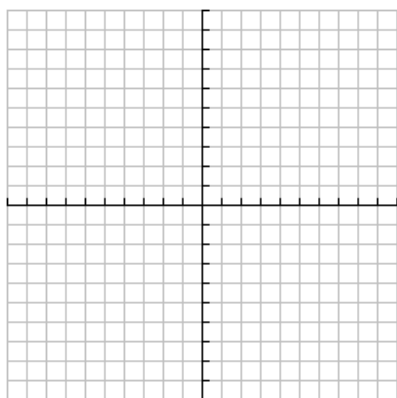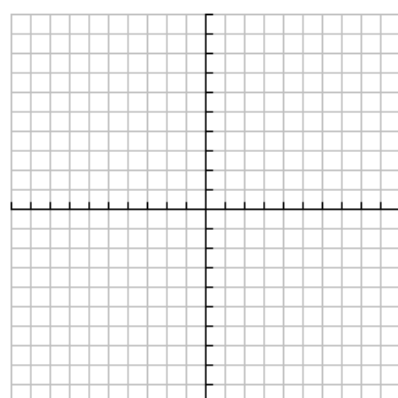58.

GRAPH PAGE:

59.

Graphs for doing 81-83

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82.

83.