Geometry HONORS Summer Practice 2026

Purpose:

This summer practice assignment was created to

- communicate what students are expected to know when entering Geometry Honors.
  - The topics in this assignment were taught in previous math courses.
- provide an opportunity for students to practice those skills and concepts necessary for success in Geometry Honors.
- provide your Geometry Honors teacher with information about the skills in which you may need more practice.

Expectations:

- Students are expected to complete this assignment independently, **without a tutor.**
- For each question in this assignment, show all of your work on loose leaf paper.
  - Your work must be clearly labeled and easy to follow.
- Box your final answers.
- Check your final answers with the key. Mark any questions you answered incorrectly.
- **This assignment will be graded for <u>completion</u> and entered as a quiz grade.**
  - **You are expected to**
    - **complete every problem.**
    - **check your answers with the key.**
    - **mark any questions you answered incorrectly with an X.**
- **This assignment is DUE on the first day of your Geometry Honors class.**
  - **They will be collected at the beginning of class.**
  - **If you turn in this assignment after the first day of class, 10 percentage points will be deducted for each day it is late.**
- **Students will be tested on the material in this packet during the first few weeks of school.**

Students entering Geometry HONORS are expected to know how to:

- Solve multi-step linear equations
- Solve and graph multi-step linear inequalities
- Recognize positive, negative, zero and undefined slope
- Write equations of lines in slope-intercept or standard form given
  - two points
  - the x and y intercepts
  - slope and one point
  - a point and the equation of a line parallel
  - a point and the equation of a line perpendicular
  - a graph
- Write equations of vertical and horizontal lines
- Set up and solve proportions
  - apply proportions to similar figures
- Solve systems of linear equations in two variables using any algebraic method (elimination and substitution)
- Simplify polynomial expressions (add, subtract and multiply)
- Factor polynomial expressions
- Solve quadratic equations
  - using square roots
  - by factoring
- Simplify radicals (Ex. $\sqrt{8} = 2\sqrt{2}$)
  - Add, subtract, multiply and divide radicals
  - Rationalize the denominator
    - (Ex. $\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$)

These skills will be incorporated into the Geometry Honors course throughout the school year.

As a member of the Sacred Heart Community,
I pledge to act in a moral, ethical, honest, and honorable way in all that I do.

_____

Student Signature

For each question in this assignment, show all of your work **on loose leaf paper.** Remember to check your final answers with the key. Mark any questions you answer incorrectly with an X. Your work must be clearly labeled and easy to follow.

Topic 1: Solving multi-step linear equations

Solve each equation. Write your final answers as improper fractions if necessary. Show work to support your answers.

1. $\frac{5-3x}{-2}=11$ **2.** $8x+\frac{1}{2}=9$ **3.** $10x+4-5x+3=7-(x-6)$ **4.** $6(7-2y)=3(5y+1)$

5. $2(x+9)-(3x-4)=-5(2x-3)$ **6.** $3(y+11)=12+3y$ **7.** $4+3y=\frac{1}{3}(9y+12)$

Topic 2: Solving and graph multi-step linear inequalities

Solve each inequality and graph the solution(s) on a number line. Write your final answers as improper fractions if necessary. Show work to support your answers.

8. $4x-7\geq 1$ **9.** $8-2n\geq 26$ **10.** $7p-11p+3>3-4p$ **11.** $-2(n-3)\geq 1-2n+5$

12. $9<3x+12<33$ **13.** $x+14<5$ or $-6x<-42$

14. Write an inequality or compound inequality to represent $x<8,\ x>-7,$ and $x>4$.

15. Write an inequality or compound inequality to represent $x>2,$ and $x>6$.

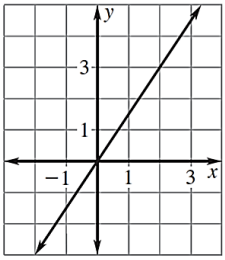
Topic 3: Recognize positive, negative, undefined and zero slope

Find the slope of the line that passes through the given points. Write your final answers as improper fractions if necessary. Show work to support your answers.

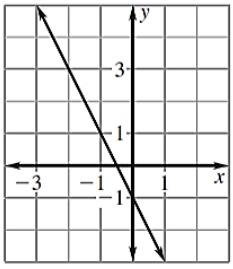
16. $(-1,4)$ & $(-7,-2)$ **17.** $(-11,14)$ & $(-11,21)$ **18.** $(5,-14)$ & $(-1,-14)$ **19.** $(-4,-5)$ & $(11,-8)$

20. Find the slope of each line.

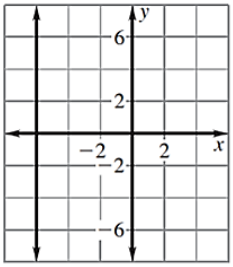
a)



b)



c)



Topic 4: Write equations of lines in slope-intercept and standard form

Use the given information to write the equation of the line in slope-intercept form. If it is not possible to write the equation in slope-intercept form, write the equation in standard form. Use improper fractions in your final answers if necessary. Show work to support your answers.

21. $(-10,7)$ & $(5,-3)$

22. $(-5,12)$ & $(-5,-4)$

23. $(-11,-3)$ & $(6,-3)$

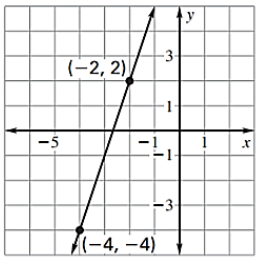
24. passes through the point $(3,5)$ and has a slope of 2

25. x-intercept is 4 and y-intercept is -2

26. passes through the point $(-2,3)$ and is **parallel** to the line $2x-4y=10$

27. passes through the point $(-3,2)$ and is **perpendicular** to the line $2x-4y=10$

28.



29. passes through the point $(-7,-5)$ and is **perpendicular** to the line $y=-4$

30. passes through the point $(-3,\ 11)$ and is **parallel** to the line $y=8$

Topic 5: Write equations of vertical and horizontal lines

31. Write the equation of the horizontal line that passes through the point $(9,-6)$.

32. Write the equation of the vertical line that passes through the point $(9,-6)$.

Topic 6: Set up and solve proportions

Solve each proportion. Write your final answers as improper fractions if necessary. Show work to support your answers.

33. $\frac{7}{5}=\frac{x}{3}$

34. $\frac{7}{c}=\frac{8}{10}$

35. $\frac{6}{m-1}=\frac{9}{7}$

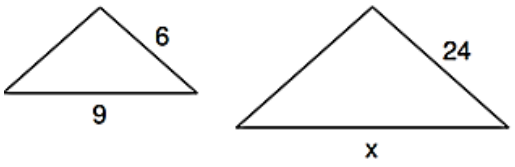
36. $\frac{x-3}{x}=\frac{9}{10}$

37. $\frac{5}{r-9}=\frac{8}{r+5}$

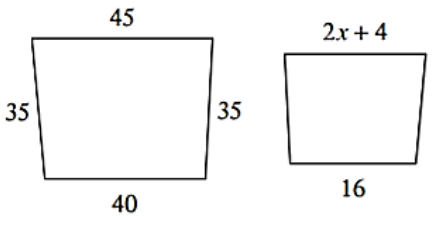
38. Mary reduced the size of a painting to a width of 3.3 inches. What is the new height if it was originally 32.5 inches tall and 42.9 inches wide? Round your answer to the nearest tenth.

For questions 39 – 41: Each pair of figures is similar. Find the value of x. Write your final answers as improper fractions if necessary. Show work to support your answers.

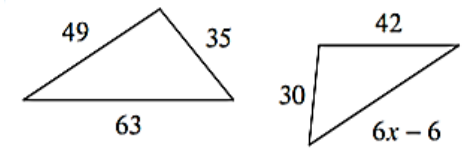
39.



40.



41.



Topic 7: Solve systems of linear equations in two variables using any algebraic method (elimination and substitution)

Solve the linear system by using substitution or elimination. Write your final answers as improper fractions if necessary. Show work to support your answers. Your work must be easy to follow.

42. $\begin{cases} 3x-2y=24 \\ 2y=-x+8 \end{cases}$ **43.** $\begin{cases} 3x=-2y+4 \\ -6x+8=4y \end{cases}$ **44.** $\begin{cases} 4y=x-3 \\ -3x=-2y+1 \end{cases}$ **45.** $\begin{cases} y=-2x+6 \\ 6x+3y=-21 \end{cases}$

Topic 8: Simplify polynomial expressions (add, subtract, and multiply)

Simplify each expression. Show work to support your answers.

46. $\left(4+2x^2\right)+\left(5x^2+2\right)$ **47.** $\left(12x^2-2x+18\right)-\left(14x^2-3x+9\right)$ **48.** $(2x+8)(3x-9)$

49. $(x+4)^2$ **50.** $(3x-1)^2$ **51.** $(5x+2)(5x-2)$ **52.** $x(5x+4)+8$

53. $(4x-1)(4x+1)$ **54.** $x^2\left(3x^2-7x+11\right)-x\left(2x^2-5x-12\right)$

Topic 9: Factor polynomial expressions

Factor each expression completely. Show work to support your answers; do not skip any steps.

55. x^2+8x+7 **56.** $-y^2+13y-40$ **57.** $2n^2+4n-48$ **58.** $-4m^2+4m+8$

59. $3z^2-8z+4$ **60.** $4d^2-17d+4$ **61.** $15p^2-27p-6$ **62.** $5x^2-20x$

63. $-7x^3+28x$

Topic 10: Solve quadratic equations

Solve each equation. Write your final answers as improper fractions or simplified radicals if necessary. Show work to support your answers; do not skip any steps.

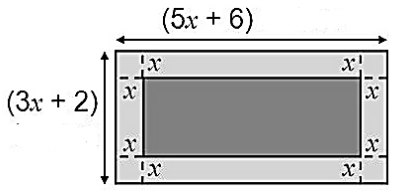
64. $x^2+8=80$ **65.** $2y^2-2=144$ **66.** $6x^2=-18x$ **67.** $8x^2-11x=5x$ **68.** $-2y^2-9y=4$

69. $12v^2+2=11v$ **70.** $-z^2-10z=16$ **71.** $8m^2-6m=5$ **72.** $n-10=-2n^2$ **73.** $-3x^2-x=-10$

Topic 10: Solve quadratic equations (continued)

Application Questions:

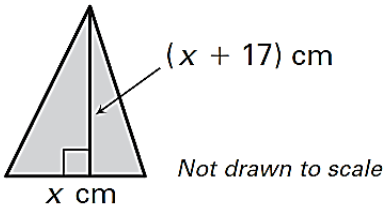
74. A rectangular outdoor patio is surrounded by a walkway as shown. The width of the walkway is x feet. The entire length of the patio and walkway is $(5x + 6)$ feet, and the width of the patio and walkway is $(3x + 2)$ feet.



a) Write a polynomial expression to represent the area of the brick walkway. Remember to include units in your answer.

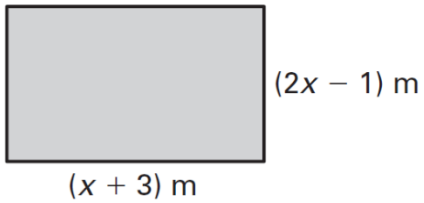
b) Suppose $x = 10$ feet. If you install brick on your walkway at a cost of \$1.50 per square foot, what is the total cost of bricking the walkway? Show work to support your answers; do not skip any steps.

75. Find the dimensions of the triangle below that has an area of 30 square centimeters. Show work to support your answer.

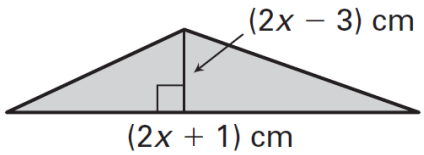


76. A small vegetable garden has an area of 80 square feet. Its length is 2 feet more than the width. Find the dimensions of the garden. Show work to support your answer.

77. Find the dimensions of the rectangle below that has an area of 15 square meters. Show work to support your answer.



78. Find the dimensions of the triangle below that has an area of 2.5 square centimeters. Show work to support your answer.



Topic 11: Radicals – simplify (add, subtract, multiply and rationalize the denominator)

Simplify each expression. Show work to support your answers; do not skip any steps.

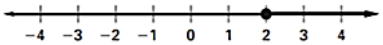
79. $\sqrt{45}$ **80.** $3\sqrt{48}$ **81.** $\sqrt{200}$ **82.** $7\sqrt{5}+5\sqrt{5}$ **83.** $3\sqrt{8}+2\sqrt{8}$

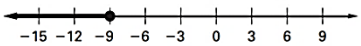
84. $6\sqrt{6}-9\sqrt{6}$ **85.** $\sqrt{3}\bullet\sqrt{10}$ **86.** $3\sqrt{5}\bullet-2\sqrt{12}$ **87.** $3\sqrt{3}\bullet\sqrt{3}$ **88.** $\left(\sqrt{19}\right)^2$

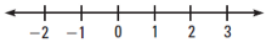
89. $\sqrt{5^2}$ **90.** $\dfrac{6}{\sqrt{2}}$ **91.** $\dfrac{12}{\sqrt{3}}$ **92.** $\dfrac{10}{\sqrt{10}}$ **93.** $\dfrac{1}{\sqrt{5}}$

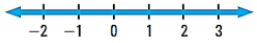
Answers: Remember to check your final answers with the key. Mark any questions you answer incorrectly with an X.

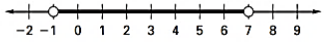
1. $x=9$ **2.** $x=\dfrac{17}{16}$ **3.** $x=1$ **4.** $y=\dfrac{13}{9}$ **5.** $x=-\dfrac{7}{9}$ **6.** No solution

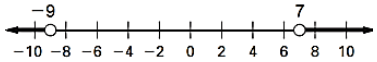
7. All real numbers **8.** $x\geq 2$; 

9. $n\leq -9$; 

10. No Solution; 

11. All real numbers; 

12. $-1<x<7$; 

13. $x<-9$ *or* $x>7$; 

14. $4<x<8$; 

15. $x>6$; 

16. $m=1$ **17.** undefined **18.** $m=0$

19. $m=-\dfrac{1}{5}$ **20. a)** $m=\dfrac{3}{2}$ **b)** $m=-2$ **c)** undefined **21.** $y=-\dfrac{2}{3}x+\dfrac{1}{3}$

22. $x=-5$ **23.** $y=-3$ **24.** $y=2x-1$ **25.** $y=\dfrac{1}{2}x-2$ **26.** $y=\dfrac{1}{2}x+4$

27. $y=-2x-4$ **28.** $y=3x+8$ **29.** $x=-7$ **30.** $y=11$ **31.** $y=-6$

32. $x=9$ **33.** $x=\dfrac{21}{5}$ **34.** $c=\dfrac{35}{4}$ **35.** $m=\dfrac{17}{3}$ **36.** $x=30$

37. $r=\dfrac{97}{3}$ **38.** 2.5 inches **39.** $x=36$ **40.** $x=7$ **41.** $x=10$

42. $(8,0)$ **43.** Infinitely many solutions **44.** $(-1,-1)$ **45.** No solution

Answers: Remember to check your final answers with the key. Mark any questions you answer incorrectly with an X.

46. $7x^2+6$ **47.** $-2x^2+x+9$ **48.** $6x^2+6x-72$ **49.** $x^2+8x+16$ **50.** $9x^2-6x+1$

51. $25x^2-4$ **52.** $5x^2+4x+8$ **53.** $16x^2-1$ **54.** $3x^4-9x^3+16x^2+12x$

55. $(x+1)(x+7)$ **56.** $-(y-5)(y-8)$ **57.** $2(n+6)(n-4)$ **58.** $-4(m+1)(m-2)$

59. $(3z-2)(z-2)$ **60.** $(d-4)(4d-1)$ **61.** $3(5p+1)(p-2)$ **62.** $5x(x-4)$

63. $-7x(x+2)(x-2)$ **64.** $x=\pm 6\sqrt{2}$ **65.** $y=\pm\sqrt{73}$ **66.** $x=0$ or $x=-3$

67. $x=0$ or $x=2$ **68.** $y=-4$ or $y=-\frac{1}{2}$ **69.** $v=\frac{2}{3}$ or $v=\frac{1}{4}$ **70.** $z=-8$ or $z=-2$

71. $m=-\frac{1}{2}$ or $m=\frac{5}{4}$ **72.** $n=2$ or $n=-\frac{5}{2}$ **73.** $x=-2$ or $x=\frac{5}{3}$

74. a) $(12x^2+16x)$ ft^2 **b)** \$2,040 **75.** 3 cm x 20 cm **76.** 8 ft x 10 ft

77. 3 m x 5 m **78.** 1 cm x 5 cm **79.** $3\sqrt{5}$ **80.** $12\sqrt{3}$ **81.** $10\sqrt{2}$

82. $12\sqrt{5}$ **83.** $10\sqrt{2}$ **84.** $-3\sqrt{6}$ **85.** $\sqrt{30}$ **86.** $-12\sqrt{15}$

87. 9 **88.** 19 **89.** 5 **90.** $3\sqrt{2}$ **91.** $4\sqrt{3}$

92. $\sqrt{10}$ **93.** $\frac{\sqrt{5}}{5}$