

Geometry Honors Summer Work

2018-2019 School Year

***Geometry Honors** is an exploration of many areas of Mathematical Sciences. These include Plane, Spherical, and Transformational Geometry, Logic and Reasoning, Trigonometry, and Geometric Probability.

*You have been recommended for this course, because of your interest in pursuing the study of advanced mathematics and your reputation as an exceptional mathematics student.

The HONORS GEOMETRY summer work consists of the completion of the following material from Algebra I (All of the problems will be in the packet behind this sheet):

1. **Algebraic Expressions**
2. **Linear Equations**
3. **Linear Inequalities**
4. **Solving by Factoring**
5. **System of Linear Equations**
6. **Square Roots and Simplifying Radical**
7. **Proportion**
8. **Distance, Midpoint, and Slope**
9. **Equations of Lines**

- If some of these skills are new to you or you feel that you have not mastered them, you should use the on-line resources that can be found by “googling” the name of the skill or you may want to get a tutor to help you. You should know all of the algebraic formulas associated with graphing, such as slope-intercept, midpoint, distance, and slope formulas.

→You will be TESTed on the summer work during the first week of school AND we WILL take up the summer work!!!

→Take advantage of the summer sales to purchase necessary materials.

Here's what you will need:

- CHS Agenda Book (available for purchase on first day of school)
- Graphing Calculator (TI-84 Plus is recommended)*

*NOTE: This is not a mandatory purchase for Geometry students, however, this technology will also be used through all 4 years of high school and into college. It would be wise to purchase this calculator now so you can use it for the rest of your high school and college career, as well as for the ACT.

And the basics:

- Pencils
- Notebook or folder to be used **only** for Geometry work.
- Notebook paper * You'll need a lot!
- Graph Paper
- Compass, Ruler, and Protractor
- A drawing template is also a good idea, but not required.

Geometry Honors Summer Work Problems

1. Algebraic Expressions (Only HAVE to do the ODD problems – can do evens for extra practice)

Exercises

Evaluate each expression if $a = 2$, $b = -3$, $c = -1$, and $d = 4$.

- | | | | |
|------------------------|--------------------|-----------------------|-----------------------|
| 1. $2a + c$ | 2. $\frac{bd}{2c}$ | 3. $\frac{2d - a}{b}$ | 4. $3d - c$ |
| 5. $\frac{3b}{5a + c}$ | 6. $5bc$ | 7. $2cd + 3ab$ | 8. $\frac{c - 2d}{a}$ |

Evaluate each expression if $x = 2$, $y = -3$, and $z = 1$.

9. $24 + |x - 4|$ 10. $13 + |8 + y|$ 11. $|5 - z| + 11$ 12. $|2y - 15| + 7$

2. Linear Equations (Only HAVE to do the ODD problems – can do evens for extra practice)

Exercises

Solve each equation.

- | | | |
|------------------------------|-----------------------------|--------------------------------------|
| 1. $r + 11 = 3$ | 2. $n + 7 = 13$ | 3. $d - 7 = 8$ |
| 4. $\frac{8}{5}a = -6$ | 5. $\frac{p}{12} = 6$ | 6. $\frac{x}{4} = 8$ |
| 7. $\frac{12}{5}f = -18$ | 8. $\frac{y}{7} = -11$ | 9. $\frac{6}{7}y = 3$ |
| 10. $c - 14 = -11$ | 11. $t - 14 = -29$ | 12. $p - 21 = 52$ |
| 13. $b + 2 = -5$ | 14. $q + 10 = 22$ | 15. $-12q = 84$ |
| 16. $5t = 30$ | 17. $5c - 7 = 8c - 4$ | 18. $2\ell + 6 = 6\ell - 10$ |
| 19. $\frac{m}{10} + 15 = 21$ | 20. $-\frac{m}{8} + 7 = 5$ | 21. $8t + 1 = 3t - 19$ |
| 22. $9n + 4 = 5n + 18$ | 23. $5c - 24 = -4$ | 24. $3n + 7 = 28$ |
| 25. $-2y + 17 = -13$ | 26. $-\frac{t}{13} - 2 = 3$ | 27. $\frac{2}{9}x - 4 = \frac{2}{3}$ |
| 28. $9 - 4g = -15$ | 29. $-4 - p = -2$ | 30. $21 - b = 11$ |
| 31. $-2(n + 7) = 15$ | 32. $5(m - 1) = -25$ | 33. $-8a - 11 = 37$ |
| 34. $\frac{7}{4}q - 2 = -5$ | 35. $2(5 - n) = 8$ | 36. $-3(d - 7) = 6$ |

3. Linear Inequalities (Only HAVE to do the ODD problems – can do evens for extra practice)

Exercises

- | | | |
|--------------------------------|-----------------------------|-------------------------------|
| 1. $x - 7 < 6$ | 2. $a + 7 \geq -5$ | 3. $4y < 20$ |
| 4. $-\frac{a}{8} < 5$ | 5. $\frac{t}{6} > -7$ | 6. $\frac{a}{11} \leq 8$ |
| 7. $d + 8 \leq 12$ | 8. $m + 14 > 10$ | 9. $12k \geq -36$ |
| 10. $6t - 10 \geq 4t$ | 11. $3z + 8 < 2$ | 12. $4c + 23 \leq -13$ |
| 13. $m - 21 < 8$ | 14. $x - 6 \geq 3$ | 15. $-3b \leq 48$ |
| 16. $-\frac{p}{5} \geq 14$ | 17. $2z - 9 < 7z + 1$ | 18. $-4h > 36$ |
| 19. $\frac{2}{5}b - 6 \leq -2$ | 20. $\frac{8}{3}t + 1 > -5$ | 21. $7q + 3 \geq -4q + 25$ |
| 22. $-3n - 8 > 2n + 7$ | 23. $-3w + 1 \leq 8$ | 24. $-\frac{4}{5}k - 17 > 11$ |

4. Solving by Factoring (Do ALL problems for this section)

$$2d^2 - 13d - 7 = 0$$

$$81x^2 = 49$$

$$6x^2 - 11x - 10 = 0$$

$$\frac{1}{4}x^2 = 25$$

$$-7 - 18x + 9x^2 = 0$$

$$9x^3 = 25x$$

$$16y^2 - 2y - 3 = 0$$

$$16y^3 = 25y$$

$$3b^2 - 18b = 10b - 49$$

$$3b^3 - 27b = 0$$

5. System of Equations (Only HAVE to do the ODD problems – can do evens for extra practice)

Exercises

Solve by graphing.

1. $y = -x + 2$

2. $y = 3x - 3$

3. $y - 2x = 1$

$$y = -\frac{1}{2}x + 1$$

$$y = x + 1$$

$$2y - 4x = 1$$

Solve by substitution.

4. $-5x + 3y = 12$

5. $x - 4y = 22$

6. $y + 5x = -3$

$$x + 2y = 8$$

$$2x + 5y = -21$$

$$3y - 2x = 8$$

Solve by elimination.

7. $-3x + y = 7$

8. $3x + 4y = -1$

9. $-4x + 5y = -11$

$$3x + 2y = 2$$

$$-9x - 4y = 13$$

$$2x + 3y = 11$$

Name an appropriate method to solve each system of equations. Then solve the system.

10. $4x - y = 11$

11. $4x + 6y = 3$

12. $3x - 2y = 6$

$$2x - 3y = 3$$

$$-10x - 15y = -4$$

$$5x - 5y = 5$$

13. $3y + x = 3$


14. $4x - 7y = 8$

15. $x + 3y = 6$

$$-2y + 5x = 15$$

$$-2x + 5y = -1$$

$$4x - 2y = -32$$

 **P18** | Lesson 9.8 | Systems of Linear Equations

6. Square Roots and Simplifying Radicals (Only HAVE to do the ODD problems – can do evens for extra practice)

Exercises

Simplify.

1. $\sqrt{32}$

2. $\sqrt{75}$

3. $\sqrt{50} \cdot \sqrt{10}$

4. $\sqrt{12} \cdot \sqrt{20}$

5. $\sqrt{6} \cdot \sqrt{6}$

6. $\sqrt{16} \cdot \sqrt{25}$

7. $\sqrt{98x^3y^6}$

8. $\sqrt{56a^2b^4c^5}$

9. $\sqrt{\frac{81}{49}}$

10. $\sqrt{\frac{121}{16}}$

11. $\sqrt{\frac{63}{8}}$

12. $\sqrt{\frac{288}{147}}$

13. $\frac{\sqrt{10p^3}}{\sqrt{27}}$

14. $\frac{\sqrt{108}}{\sqrt{2q^6}}$

15. $\frac{4}{5 - 2\sqrt{3}}$

16. $\frac{7\sqrt{3}}{5 - 2\sqrt{6}}$

17. $\frac{3}{\sqrt{48}}$

18. $\frac{\sqrt{24}}{\sqrt{125}}$

19. $\frac{3\sqrt{5}}{2 - \sqrt{2}}$

20. $\frac{3}{-2 + \sqrt{13}}$

7. Proportions (MUST do ALL problems – EVEN and ODD)

1 – 14: Solve each proportion:

1.

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

2.

$$\frac{7}{n} = \frac{8}{7}$$

3.

$$\frac{10}{8} = \frac{n}{10}$$

4.

$$\frac{4}{9} = \frac{r-3}{6}$$

5.

$$\frac{4}{9} = \frac{r-3}{6}$$

6.

$$\frac{4}{n+2} = \frac{7}{n}$$

7.

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

8.

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

9.

$$\frac{2x+2}{2x-1} = \frac{1}{3}$$

10.

$$\frac{3x+1}{14} = \frac{5}{7}$$

11.

$$\frac{x-3}{4} = \frac{x+1}{5}$$

12.

$$\frac{x+4}{26} = -\frac{1}{3}$$

13.

$$\frac{p+10}{p-7} = \frac{8}{9}$$

14.

$$\frac{n-6}{n-7} = \frac{9}{2}$$

8. Distance, Midpoint, and Slope (MUST do ALL problems – EVEN and ODD)

1 – 12: Find the **DISTANCE**, **MIDPOINT**, and **SLOPE** of each set of points below.

1. (-4, -2) (3, 3)

2. (-1, 0) (-3, -4)

3. 7, 6) (0, 2)

4. (4, 2) (-6, -6)

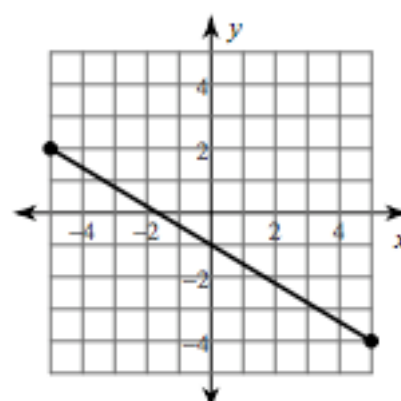
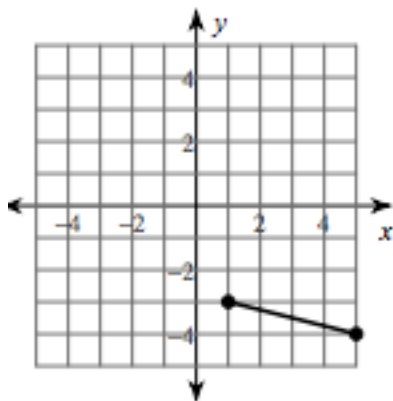
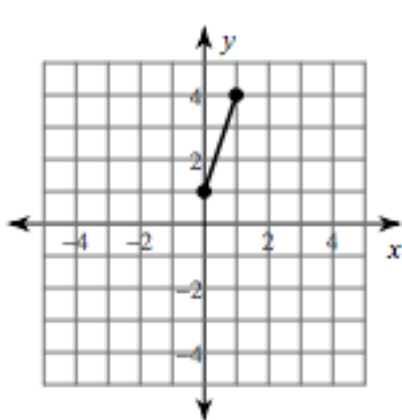
5. (-6, 1) (-3, 1)

6. (-3, 6) (2, 1)

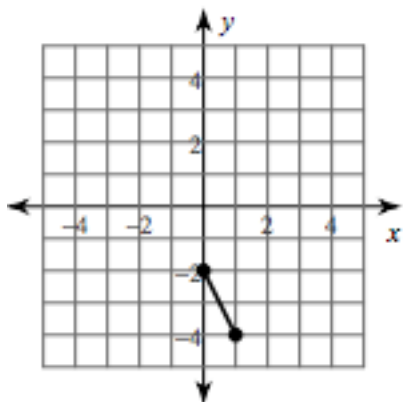
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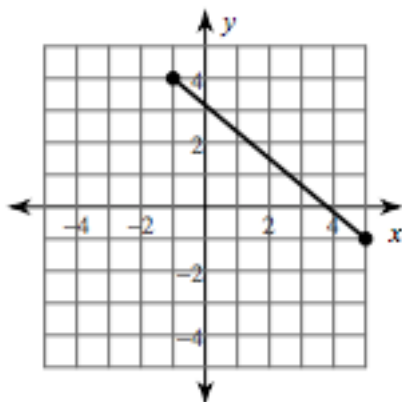
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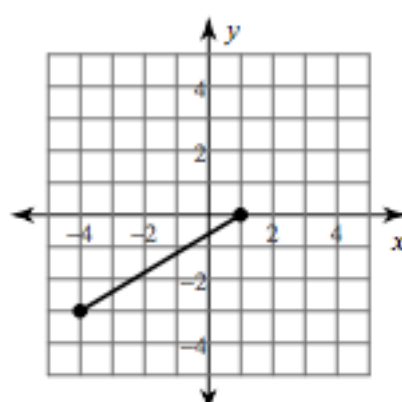
10.



11.



12.



13 – 14: Find the other endpoint of the line segment with the given endpoint and midpoint.

13. Endpoint $(-5, 4)$ and midpoint $(-10, -6)$

14. Endpoint $(-8, 8)$ and midpoint $(5, -3)$

15 – 26: Find the SLOPE of each line.

15. $y = -5x - 1$

16. $y = \frac{1}{3}x - 4$

17. $y = -\frac{1}{5}x + 4$

18. $x = 1$

19. $y = \frac{1}{4}x + 1$

20. $y = -\frac{2}{3}x - 1$

21. $y = -x + 2$

22. $y = -x - 1$

23. $2x + 3y = 9$

24. $3x - 5y = 7$

25. $7x + 6y = 4$

26. $3y = 6$

9. Equations of Lines (MUST do ALL problems – EVEN and ODD)

1 – 13: Write each problem in slope-intercept form of the equation.

1. $3x - 2y = -16$

2. $13x - 11y = -12$

3. $11x + 4y = 32$

4. Through $(1, 2)$ with slope of 7

5. Through $(3, 5)$ with slope $5/3$

6. Through $(4, -5)$ with undefined slope

7. Through $(2, -5)$ with slope of 0

8. Through $(-1, 4)$ and parallel to $y = -5x + 2$

9. Through $(0, -7)$ and parallel to $3x + 2y = 12$

10. Through points $(1, -5)$ and $(5, 7)$

11. Through points $(-7, 3)$ and $(0, 5)$

12. Through $(0, 5)$ and $(-7, 5)$

13. Through points $(-4, 5)$ and $(-4, 8)$