


# Advanced Geometry



## Summer Assignment

## Advanced Geometry - Summer Assignment 2023

Dear Prospective Geometry Students,

Welcome to Advanced Geometry.  In order to ensure that each of you is fully prepared and set for success, you will need to complete the following summer assignment. It will cover the following key Algebra 1 concepts that should serve as a review of prior learning as well as a description of when it will be built upon. Corresponding Algebra TEKS have been listed by each topic:

- Solving linear equations – used all year
  - TEKS: 5A, 5B, 5C, 2H
- Graphing linear equations – used during/after unit 3
  - TEKS: 3A, 3C
- Finding slope from ordered pairs and/or linear equations – used during/after unit 3
  - TEKS: 3A, 3B
- Writing equations of lines in slope-intercept, point-slope and standard forms – used during/after unit 3
  - TEKS: 2B, 2C, 2E, 2F, 2G
- Solving systems of equations – used all year
  - TEKS: 2I, 3D, 3F, 3H, 5C
- Multiplying binomials – used all year
  - TEKS: 10B, 10C, 11B
- Factoring – used all year
  - TEKS: 7A, 10E
- Solving quadratic equations by factoring and with Quadratic Formula – used all year
  - TEKS: 7A, 8A
- Simplifying, multiplying, and adding radicals – used all year but extensively during/after unit 8
  - TEKS: 11A
- Solving right triangles using the Pythagorean Theorem – used all year
  - Pre-algebra skill
  - TEKS: 11B, 10A
- Multiplying, dividing, adding and subtracting expressions with exponents, take a power to a power, simplifying expressions with negative exponents – used all year
  - TEKS: 10A, 10B, 10C, 10D, 11B
- Adding, subtracting, multiplying, dividing, and simplifying fractions – used all year
  - TEKS: 10A, 10B, 10C, 10D, 11B
- Solving literal equations – used all year
  - TEKS: 12E

It is very difficult to learn two courses at the same time. Students who struggle with geometry tend to have deficiencies in one or more of the above-listed topics. Geometry students having to learn geometry and be retaught algebra 1 at the same time is **not** an ideal situation. This situation leads to MAJOR struggles and lower grades. Thus, it would be HIGHLY suggested that these topics be mastered as soon as possible.

With the previous paragraph in mind, this summer assignment is required. Students will routinely be using topics from this assignment within geometry problems throughout the entire year.

For your benefit, the summer assignment includes the answers. Please check your answers and correct any missed problems. Be prepared to ask questions on topics you have missed.

You may need to look up some vocabulary through Google or other resources. The following website are additional tutorial resources:

- [khanacademy.org](https://www.khanacademy.org)
- [itutoring.com](https://www.itutoring.com) (username – carroll, password – dragons)
- [youtube.com](https://www.youtube.com) (simply search the topic)
- [google.com](https://www.google.com)
- [mathstv.com](https://www.mathstv.com)

**A major-grade test over these concepts will take place during the second or third week of school. The test will be non-calculator and you will not be able to use a formula chart. During the first week of school, further review over these algebra topics will take place. However, this will not take the place of completing the review.**

Leave answers in simplified radical form or improper fractions (no decimals).

**Bring this completed review packet to the first class meeting (all work must be shown). Depending on how well the material is mastered and retained, it is estimated that the summer assignment can be completed within 45 minutes-120 minutes. Part of the first few days of school are dedicated to algebra 1 review. Please come prepared with any questions about the summer assignment.**

This assignment may be collected, but it is not a grade. Due date will be the date of the major grade test in week two or three of school.

We look forward to meeting you in August!

Regards,  
The CISD Advanced Geometry Team

This assignment should be completed without the use of a calculator nor an EOC chart.  
Show all work. Assignments with only answers are not acceptable.

\_\_\_\_\_ 1. Which of the following is irrational?

A.  $\sqrt{(2^4)}$

B.  $\sqrt{900}$

C.  $\sqrt{(10)(2.5)}$

D.  $\sqrt{(10)(80)}$

**2-8 Solve. Leave answers as simplified fractions. (No decimals or mixed numbers).**

\_\_\_\_\_ 2.  $4(3n + 5) - 2(2 - 4n) = 6 - 2n$

\_\_\_\_\_ 3.  $3x - 12 - 5x = 5 - 6x - 9$

\_\_\_\_\_ 4.  $\frac{2}{3}x - \frac{1}{6} = 7$  (Remember: clear the fractions first!)

\_\_\_\_\_ 5.  $\frac{2}{15}x + \frac{3}{5}x = \frac{7}{15} + \frac{2}{3}x$  (Remember: clear the fractions first!)

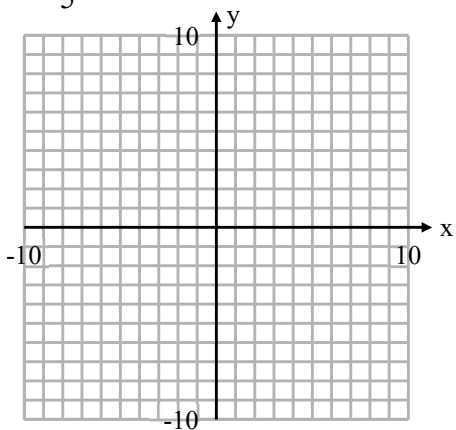
\_\_\_\_\_ 6.  $2(4x) - (x - 1) = 2(1 - x)$

\_\_\_\_\_ 7.  $\frac{2}{3}a - \frac{5}{6} = \frac{1}{2}a - 4$  (Remember: clear the fractions first!)

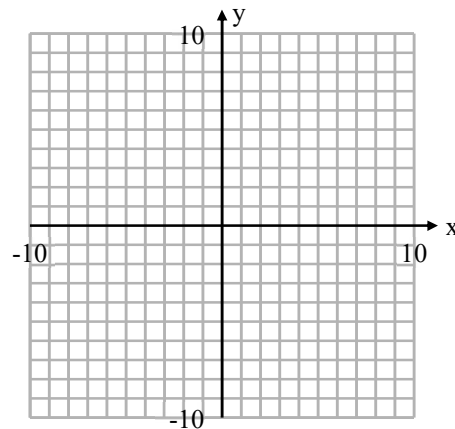
\_\_\_\_\_ 8. Evaluate the expression,  $\frac{1}{2}a - 6b$ , for  $a = -1/2$  and  $b = -2/3$ .

**Graph each line with a straight edge:**

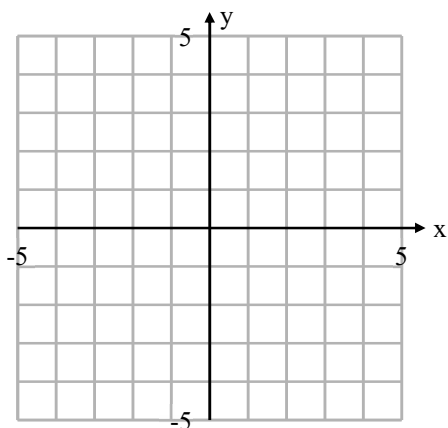
9.  $y = -\frac{2}{5}x - 3$



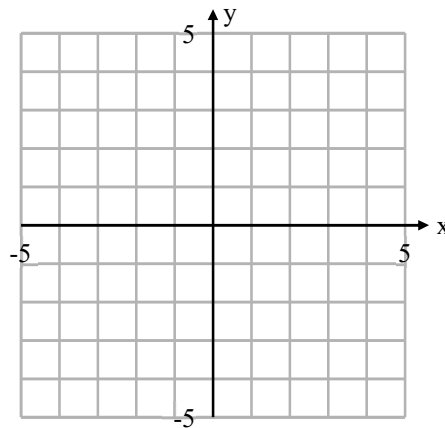
10.  $3x - 2y = 12$



11.  $y = 3$

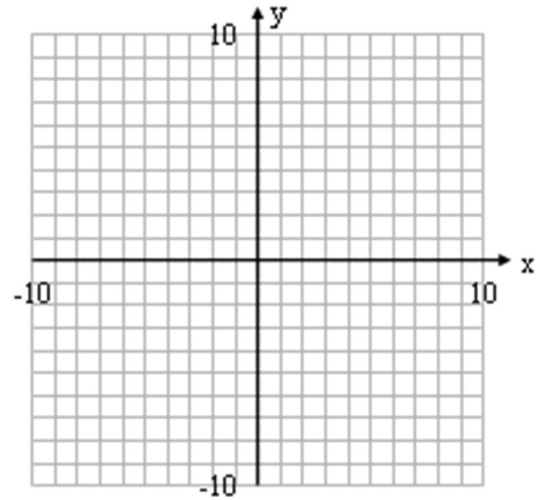


12.  $x = -1$

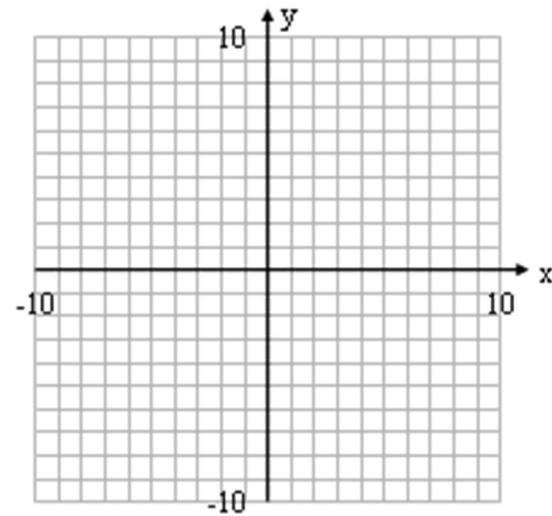


13. What is the point of intersection of the graph  $3x - 2y + 6 = 0$  with the y-axis?

14. A triangle is formed by the intersection of the lines  $y = 2$ ,  $x = 0$ , and  $y = -2x + 8$ . What is the area of the triangle? All lines must be graphed with a straight edge.



15. A region is bounded by the lines  $y = 4$ ,  $y = x + 4$  and  $y = -2(x - 6) - 2$ . What is the area of the region? All lines must be graphed with a straight edge. Be careful about locating the corners of the polygon.



**Determine the slope of each line:**

\_\_\_\_\_ 16.  $y = -2x - 4$

\_\_\_\_\_ 17. a horizontal line

\_\_\_\_\_ 18. a vertical line

\_\_\_\_\_ 19.  $y = -x$

\_\_\_\_\_ 20. The line passing through A (-2, 3) and B (2,-4).

\_\_\_\_\_ 21. What is the slope of a line perpendicular to  $2x - 3y = 8$ ?

\_\_\_\_\_ 22. If the slope of a line is  $\frac{5}{3}$  and it passes through points (6,4) and (x,8), what is the value of x?

**23-29: Write the equation of the line described in the form noted.**

\_\_\_\_\_ 23. Slope 2, y intercept -4  
(Express answer in slope-intercept form.)

\_\_\_\_\_ 24. Passing through the points (-1,3) and (5, 7)  
(Express answer in standard form.)

\_\_\_\_\_ 25. With undefined slope, passing through (2, 1).

\_\_\_\_\_ 26. Slope  $-\frac{3}{5}$ , passing through the point (5, -2)  
(Express answer in point-slope form.)

\_\_\_\_\_ 27. Passing through (5, 6) but parallel to  $3x - 5y = 8$ .  
(Express answer in standard form.)

\_\_\_\_\_ 28. Passing through (-3,4) but perpendicular to  $y = 3x + 5$ .  
(Express answer in standard form.)

\_\_\_\_\_ 29. What is the equation of a line if it is parallel to  $y = 3x - 6$  and has an x-intercept of 4? (Express answer in standard form.)

**Solve each system of equations using elimination or substitution. You must solve by hand and without a calculator. For 30 – 32, express your answer as an ordered pair.**

\_\_\_\_\_ 30.  $2x - 3y = 8$   
 $x + y = 4$

\_\_\_\_\_ 31.  $3y - 2x = 4$   
 $\frac{1}{6}(3y - 4x) = 1$

\_\_\_\_\_ 32.  $5x - 2y = 3$   
 $2x + 7y = 9$

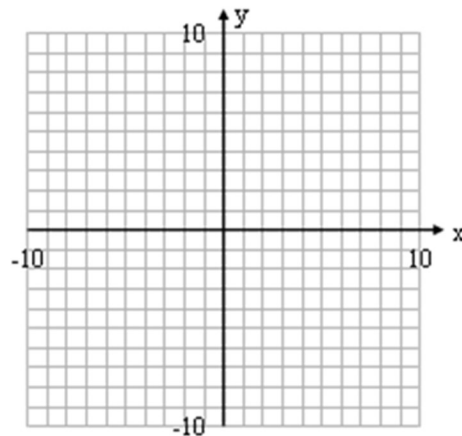
\_\_\_\_\_ 33.  $2x - 3y = 1$   
 $3x + 5y = 11$   
(This one only – what is  $x - y$ ?)



34. Which equation represents a line that intersects  $y = -1/2 x - 5$  at exactly one point?

- I.  $y = -2/3 x - 3$
- II.  $y = -0.5x - 2$
- III.  $y = -2/4x - 5$
- IV.  $y = -0.5x + 5$

- A. I only
- B. I and II only
- C. I, II, and III only
- D. I, II, III, and IV
- E. none of the above



35. Write  $x^2(x+2) - 3x(x+2) + 2(x+7)$  as a simplified polynomial.

**Multiply.**

\_\_\_\_\_ 36.  $(x - 3)(x + 7)$

\_\_\_\_\_ 37.  $(2x - 1)(5x + 3)$

\_\_\_\_\_ 38.  $(x + 8)^2$

\_\_\_\_\_ 39.  $(2x - 3)^2$

\_\_\_\_\_ 40.  $(2 - \sqrt{5})(4 + \sqrt{5})$

\_\_\_\_\_ 41.  $(2\sqrt{3})^2$

**Factor.**

\_\_\_\_\_ 42.  $a^2 + 9a + 18$

\_\_\_\_\_ 43.  $2a^2 + a - 15$

\_\_\_\_\_ 44.  $3y^2 - 14y - 24$

\_\_\_\_\_ 45.  $b^2 - 8b + 16$

\_\_\_\_\_ 46.  $x^2 - 81$

\_\_\_\_\_ 47.  $16p^2 - 25$

\_\_\_\_\_ 48.  $2x^3 + 8x^2 - 24x$

**Solve by factoring.**

\_\_\_\_\_ 49.  $3x^2 + 13x - 10 = 0$

\_\_\_\_\_ 50.  $2a^2 + 5a = -4(a + 1)$

\_\_\_\_\_ 51.  $a^2 - 4a = 21$

**Solve using the Quadratic Formula. State exact answers in simplified radical form.**

\_\_\_\_\_ 52.  $a^2 - 3a - 6 = 0$

\_\_\_\_\_ 53.  $2a^2 + 5a + 1 = 0$

**Simplify.**

\_\_\_\_\_ 54.  $\sqrt{45}$

\_\_\_\_\_ 55.  $3\sqrt{72}$

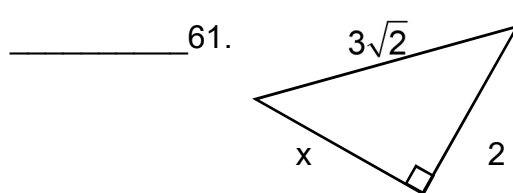
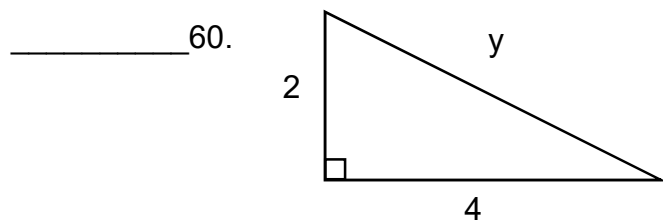
\_\_\_\_\_ 56.  $5\sqrt{32}$

\_\_\_\_\_ 57.  $7\sqrt{3} - 3\sqrt{3}$

\_\_\_\_\_ 58.  $3\sqrt{6} + \sqrt{24}$   
(Hint: simplify before adding.)

\_\_\_\_\_ 59.  $7\sqrt{8} \cdot 5\sqrt{2}$

**Use the Pythagorean Theorem to find the value of the variable. Give exact answers in simplified radical form.**



\_\_\_\_\_ 62. In little league baseball, the distance of the paths between each pair of consecutive bases is 60 feet and the paths form right angles. How far does the ball need to travel if it is thrown from home plate directly to second base?

**Simplify.**

\_\_\_\_\_ 63.  $a^5 \cdot a \cdot a^{-2}$

\_\_\_\_\_ 64.  $\frac{16x^2y}{2xy}$

\_\_\_\_\_ 65.  $(2n)^4 \cdot (3n)^2$

\_\_\_\_\_ 66.  $(3x^2y)^2 \cdot (-4xy^3)$

\_\_\_\_\_ 67.  $\frac{2x^{-2}y}{6x^2y^{-5}}$

\_\_\_\_\_ 68.  $-2^2$

\_\_\_\_\_ 69.  $(-2)^2$

70. If  $3x = 3x^3$ , what value(s) of x satisfy the equation?

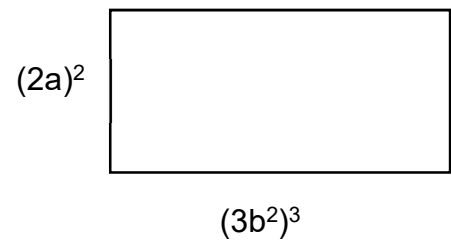
- I. -1
- II. 0
- III. 1

- A. II only    B. III only    C. II and III only    D. I and III only    E. I, II, and III

**71. Calculate the area and perimeter of the rectangle.**

A = \_\_\_\_\_

P = \_\_\_\_\_



**Solve each literal equation for the stated variable.**

\_\_\_\_\_ 72. Solve  $P = 2l + 2w$  for  $w$

\_\_\_\_\_ 73. Solve  $A = \frac{1}{2}bh$  for  $h$

\_\_\_\_\_ 74. Solve  $V = \pi r^2 h$  for  $h$

\_\_\_\_\_ 75. Solve  $F = \frac{9}{5}C + 32$  for  $C$

\_\_\_\_\_ 76. Solve  $S = \pi rL + \pi r^2$  for  $L$

\_\_\_\_\_ 77. Solve  $\frac{4x + y}{3y} = 2$  for  $y$ .

(multiple choice)

A.  $y = x$       C.  $y = \frac{4x}{5}$

B.  $y = \frac{4x}{7}$       D.  $y = \frac{3}{2x}$

**Answer Key:**

1. D

2.  $-\frac{5}{11}$

3. 2

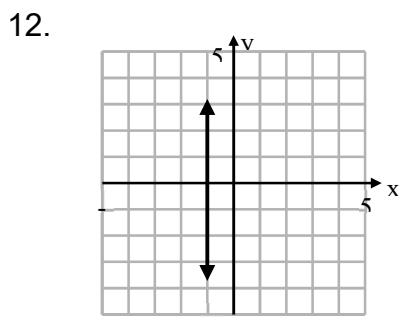
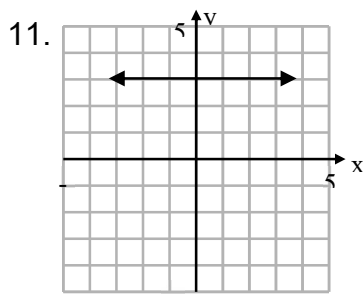
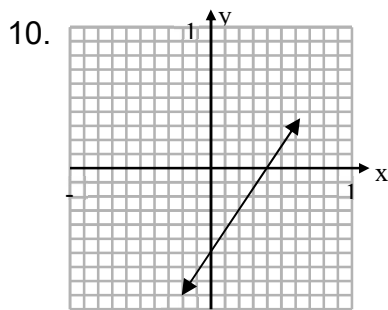
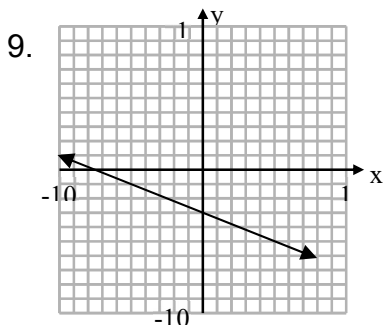
4.  $\frac{43}{4}$

5. -5

6.  $\frac{1}{9}$

7. -19

8.  $15\frac{1}{4}$



13. (0,3)

14.  $A = 9 \text{ units}^2$

15.  $A = 3 \text{ units}^2$

16. -2

17. 0

18. Undefined

19. -1

20.  $-\frac{7}{4}$

21.  $-\frac{3}{2}$

22.  $42\frac{2}{5}$

23.  $y = 2x - 4$

24.  $2x - 3y = -11$

25.  $x = 2$

26.  $y + 2 = -\frac{3}{5}(x - 5)$

27.  $3x - 5y = -15$

28.  $x + 3y = 9$

29.  $3x - y = 12$

30. (4, 0)

31.  $(-1, \frac{2}{3})$

32. (1, 1)

33. (2, 1) so  $x - y = 1$

34. A

35.  $x^3 - x^2 - 4x + 14$

36.  $x^2 + 4x - 21$

37.  $10x^2 + x - 3$

38.  $x^2 + 16x + 64$

39.  $4x^2 - 12x + 9$

40.  $3 - 2\sqrt{5}$

41. 12

42.  $(a + 6)(a + 3)$

43.  $(2a - 5)(a + 3)$

44.  $(3y + 4)(y - 6)$

45.  $(b - 4)^2$

46.  $(x - 9)(x + 9)$

47.  $(4p - 5)(4p + 5)$

48.  $2x(x + 6)(x - 2)$

$$49. x = \frac{2}{3} \text{ or } x = -5$$

$$50. a = -4 \text{ or } a = -\frac{1}{2}$$

$$51. a = 7 \text{ or } a = -3$$

$$52. \frac{3 \pm \sqrt{33}}{2}$$

$$53. \frac{-5 \pm \sqrt{17}}{4}$$

$$54. 3\sqrt{5}$$

$$55. 18\sqrt{2}$$

$$56. 20\sqrt{2}$$

$$57. 4\sqrt{3}$$

$$58. 5\sqrt{6}$$

$$59. 140$$

$$60. 2\sqrt{5}$$

$$61. \sqrt{14}$$

$$62. 60\sqrt{2} \text{ ft.}$$

$$63. a^4$$

$$64. 8x$$

$$65. 144n^6$$

$$66. -36x^5y^5$$

$$67. \frac{y^6}{3x^4}$$

68. -4 b/c following order of operations you work the exponent before multiplying by -1.

$$69. 4$$

$$70. E$$

$$71. A = 108a^2b^6$$

$$P = 8a^2 + 54b^6$$

$$72. w = \frac{P - 2I}{2}$$

$$73. h = \frac{2A}{b}$$

$$74. h = \frac{V}{\pi r^2}$$

$$75. C = \frac{5}{9}(F - 32)$$

$$76. \frac{S - \pi r^2}{\pi r} = L$$

$$77. C$$