

# **Summer Packet: Geometry and Algebra Skills to get you ready for HS Geometry**

*(For students entering Geometry 21/22)*

Students entering Geometry 21 and 22 should complete the problems in this packet **BEFORE** returning to school. All topics in this packet have been taught to the students in previous math courses. **Students will be held responsible for mastering these concepts BEFORE the first day of school.** Geometry teachers will review questions on the packet as necessary before assessing the students on their understanding of the concepts covered by the packet. Students should expect an assessment within the first week of their Geometry course.

Answers to all problems are included on the last page of this packet.

**Need help on some of the topics?** For each section a link to an instructional video has been provided!

**Geometry Summer Packet**

<ul style="list-style-type: none"><li>• Pre-Algebra &amp; Algebra I Skills<ul style="list-style-type: none"><li>- Rounding Decimals</li><li>- Simplifying Fractions</li><li>- Solving Equations</li><li>- Factoring and Solving Polynomials</li><li>- Solving Propotions</li><li>- Finding Slope</li><li>- Graphing Ponts and Lines on the Coordinate Plane</li><li>- Parallel and Perpendicular Slopes</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Geometry Basic Skills<ul style="list-style-type: none"><li>- Using a Protractor (Section 1.4)</li><li>- Types of Angles: Acute, obtuse, right, straight angle (Section 1.4)</li><li>- Complementary &amp; Supplementary Angles (Section 1.5)</li><li>- Parallel and Perpendicular Lines (Sections 3.1 &amp; 1.6)</li><li>- Identifying Polygons (page 57)</li><li>- Congruence (Section 4.1)</li><li>- Types of Triangles: equilateral, isosceles, scalene</li><li>- Perimeter and Circumference</li><li>- Basic Area: triangle, circle, rectangle/square, trapezoid (Chapter 10)</li><li>- Pythagorean theorem (Section 8.1)</li></ul></li></ul>
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**\*\*This summer packet will help you review the above skills that you have already been taught in previous grades. Please complete this and get help on topics you are unsure of. You are expected to know and use these topics in this Geometry course. There will be an assessment given within the FIRST week on these topics and skills. You may use a calculator and a formula sheet.**

**ALGEBRA BASIC SKILLS:**

Rounding decimals tutorial

- [Rounding decimals](#)

***ROUNDING DECIMALS***

1. Round the following decimals to the nearest tenth, hundredth, *and* whole number.

a. 23.49761

b. 301.8234687

tenth: \_\_\_\_\_ hundredth: \_\_\_\_\_

tenth: \_\_\_\_\_ hundredth: \_\_\_\_\_

whole number: \_\_\_\_\_

whole number: \_\_\_\_\_

Simplifying tutorial

- [Simplify fractions](#)

***SIMPLIFYING FRACTIONS***

2. Simplify the following fractions completely.

a.  $\frac{8}{20}$

b.  $\frac{18}{126}$

c.  $\frac{45}{63}$

d.  $\frac{54}{45}$

Solving equations tutorials

- [Solutions-to-linear-equations](#)
- [Solving-for-a-variable](#)
- [Solving-more-complicated-equations](#)

### ***SIMPLIFYING EXPRESSIONS & SOLVING EQUATIONS***

3. Simplify the following expressions.

a.  $-2(7y^2 - 3y)$

b.  $(x - 7)(3x + 4)$

c.  $(x - 4)^2$

4. Solve the following equations for  $x$ . If necessary round your answer to the nearest hundredth.

a.  $\frac{8}{9} = \frac{x}{12}$

b.  $\frac{2}{3} = \frac{x+7}{3x}$

c.  $\frac{5}{x} = \frac{x+2}{3}$

d.  $3(x + 4) + 2x = 6x - 9$

e.  $16x - 3(4x + 7) = 6x - (3x + 25)$

Quadratic Equations tutorials

- [Solving-quadratic-equations-by-square-roots](#)
- [Factoring-quadratic-expressions](#)
- [Using-the-quadratic-formula](#)

### ***FACTORING & SOLVING POLYNOMIAL EQUATIONS***

5. Factor each of the following.

a.  $x^2 + 7x + 10$

b.  $x^2 + 2x - 8$

c.  $4m^2 + 22m + 10$

d.  $3x^2 - 8x + 4$

6. Solve each of the following using the Zero Product Property.

a.  $x^2 - 2x - 24 = 0$

b.  $2x^2 + 5x = -2$

c.  $5x^2 + 6 = 17x$

System of Equations Tutorials

[Solving-linear-systems-by-graphing](#)

[Special-types-of-systems-of-equations](#)

[Solving-systems-by-substitution](#)

[Solving-systems-by-elimination/combination](#)

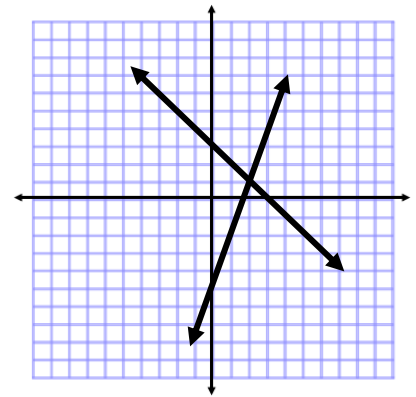
### ***SOLVING SYSTEMS OF EQUATIONS***

7. Determine the value of  $x$  and  $y$  in each system.

a. Graphing (use the diagram to the right)

$$y = 3x - 5$$

$$y = -x + 3$$



b. Substitution

i.  $4x + 4y = 12$

$$y = -3x + 9$$

ii.  $y = 3x - 4$

$$x - 4y = -28$$

c. Elimination/Combination

i.  $3x + 4y = 24$

$$-3x + 6y = 6$$

ii.  $2x - 3y = 13$

$$-3x - 2y = 0$$

d. Solve the following using the method of your choice

$$y = 4x - 1$$

$$y = -2x - 7$$

Linear Functions tutorials

- [Slope](#)
- [Slope-intercept-form](#)
- [Point-slope-form](#)
- [Standard-form](#)

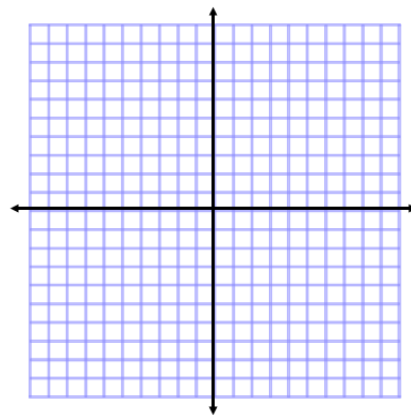
**GRAPHING LINES**

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

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

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

9. Write the equation of a line with a slope =  $\frac{1}{4}$  and y-intercept of 4.  
Then graph the equation.



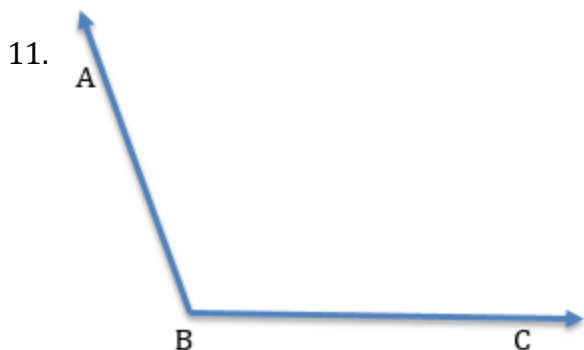
10.  $\overrightarrow{AB}$  (line AB) has the equation  $y = 5x + 7$ .

- What is the slope of a line parallel to it?
- What is the slope of a line perpendicular to it?

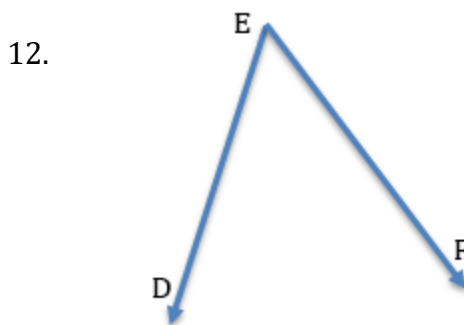
**GEOMETRY BASIC SKILLS:**

**ANGLES**

Use a protractor to measure the following angles. Then classify each as acute, or obtuse.

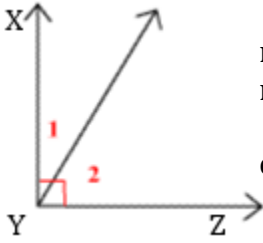


$m\angle ABC =$  \_\_\_\_\_ ; \_\_\_\_\_



$m\angle DEF =$  \_\_\_\_\_ ; \_\_\_\_\_

13.  $\angle XYZ$  is a right angle.  
Find the measures of  $\angle 2$

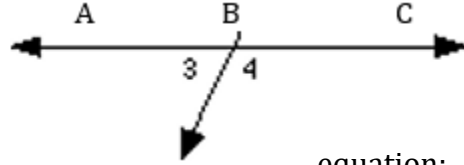


$m\angle 1 = 37^\circ$   
 $m\angle 2 = ?$

equation: \_\_\_\_\_

$m\angle 2 = \underline{\hspace{2cm}}$

14.  $m\angle ABC = 180^\circ$ , therefore it is called a \_\_\_\_\_  
angle. Find the measure of  $\angle 4$ .



$m\angle 3 = 52^\circ$   
 $m\angle 4 = ?$

equation: \_\_\_\_\_


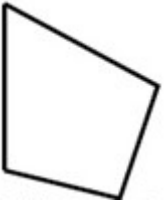
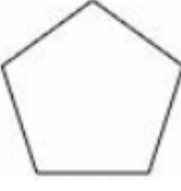
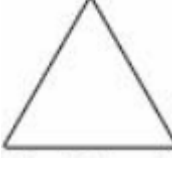

$m\angle 4 = \underline{\hspace{2cm}}$

15. In #13 above,  $\angle 1$  and  $\angle 2$  are a pair of (complementary/supplementary) angles. (circle correct word)

16. In #14 above,  $\angle 3$  and  $\angle 4$  are a pair of (complementary/supplementary) angles. (circle correct word)

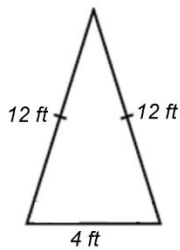
**POLYGONS**

17. Fill in the chart below:

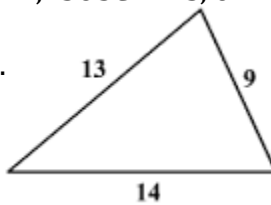
Diagram					
Number of sides					
Name of polygon					

Classify each triangle below as SCALENE, ISOSCELES, or EQUILATERAL.

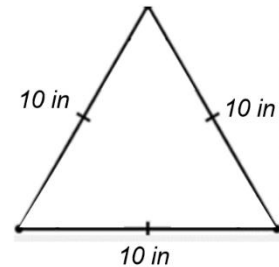
18.



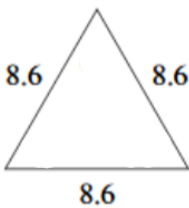
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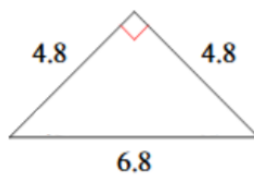
20.



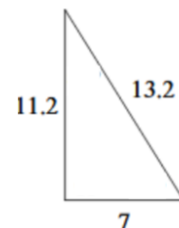
21.



22.

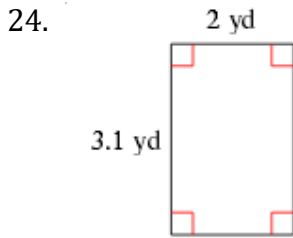


23.

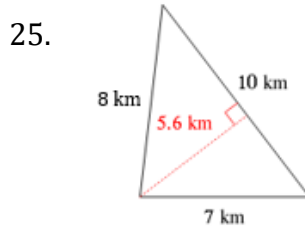


**AREA AND PERIMETER**

Find the area and perimeter of each figure;

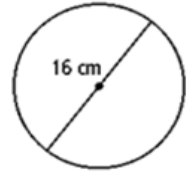


A = \_\_\_\_\_ P = \_\_\_\_\_

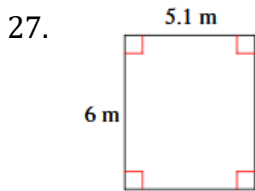


A = \_\_\_\_\_ P = \_\_\_\_\_

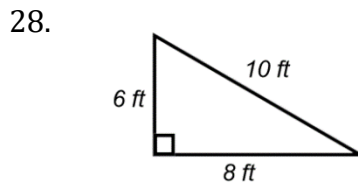
26. Leave pi in your answer or use pi button and round to hundredth.



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

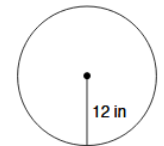


A = \_\_\_\_\_ P = \_\_\_\_\_



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

29. Leave pi in your answer or use pi button and round to hundredth.



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

**Identifying PARALLEL AND PERPENDICULAR LINES**

Use the diagram to the right to name a pair of

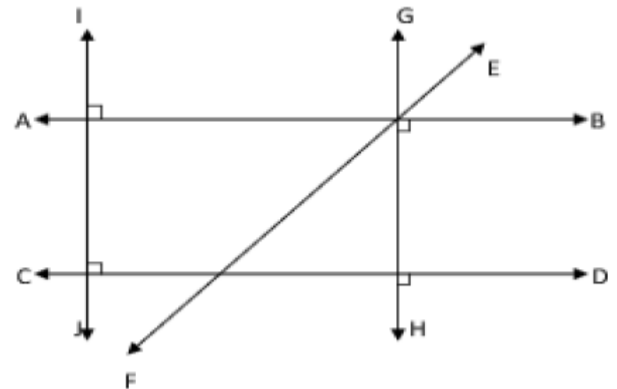
30. parallel lines \_\_\_\_\_

31. perpendicular lines \_\_\_\_\_

32. Fill in the blanks with "parallel" or "perpendicular";

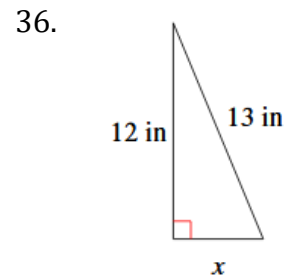
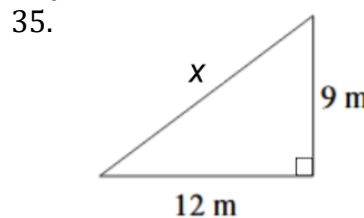
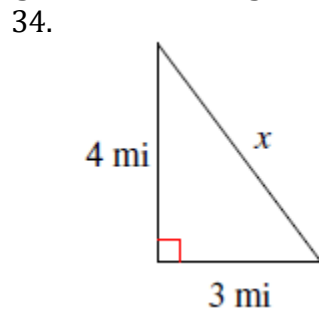
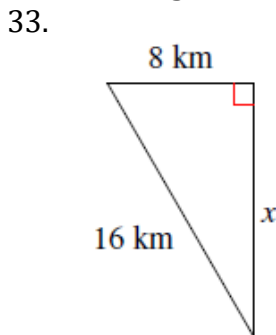
$\overleftrightarrow{AB}$  is \_\_\_\_\_ to  $\overleftrightarrow{CD}$

$\overleftrightarrow{CD}$  is \_\_\_\_\_ to  $\overleftrightarrow{GH}$



**PYTHAGOREAN THEOREM**

Find the length of the missing side in each diagram. Round your answers to the nearest hundredth.



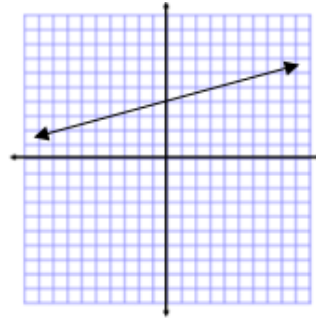
ANSWERS:

1. a. tenth: 23.5, hundredth: 23.50, whole: 23  
b. tenth: 301.8, hundredth: 301.82, whole: 302
2. a.  $\frac{2}{5}$  b.  $\frac{1}{7}$  c.  $\frac{5}{7}$  d.  $\frac{6}{5}$
3. a.  $-14y^2 + 6y$  b.  $3x^2 - 17x - 28$  c.  $x^2 - 8x + 16$
4. a.  $x = 10.67$  b.  $x = 7$  c.  $x = 3, \text{ or } -5$  d.  $x = 21$  e.  $x = -4$
5. a.  $(x + 5)(x + 2)$  b.  $(x + 4)(x - 2)$  c.  $2(2m + 1)(m + 5)$  d.  $(3x - 2)(x - 2)$
6. a.  $x = 6, \text{ or } -4$  b.  $x = -2, \text{ or } -\frac{1}{2}$  c.  $x = \frac{2}{5}, \text{ or } 3$
7. a. (2, 1) b. i. (3, 0)  $x=3, y=0$  ii. (4, 8)  $x=4, y=8$

c. i. (4, 3)  $x=4, y=3$  ii. (2, -3)  $x=2, y=-3$  d. (-1, -5)  $x=-1, y=-5$

8. a. slope =  $\frac{1}{4}$ ; perpendicular slope = -4 b. slope = -1; perpendicular slope = 1

9.  $y = \frac{1}{4}x + 4$  graph  $\rightarrow\rightarrow\rightarrow$



10. a. 5 b.  $-\frac{1}{5}$

11.  $110^\circ$ , obtuse

12.  $55^\circ$ , acute

13.  $m\angle 2 + 37 = 90$ ;  $m\angle 2 = 53^\circ$

14. *straight angle*;  $m\angle 4 + 52 = 180$ ;  $m\angle 2 = 128^\circ$

15. Complementary

16. Supplementary

17. 8, octagon; 4, quadrilateral; 5, pentagon; 3, triangle, 6, hexagon

18. Isosceles

19. Scalene

20. Equilateral

21. Equilateral

22. Isosceles

23. Scalene

(area is measured in square units and perimeter is measured in units)

24.  $A = 6.2, P = 10.2$

25.  $A = 28, P = 25$

26.  $A = 64\pi \approx 201.06, C = 16\pi \approx 50.27$

27.  $A = 30.6, P = 22.2$

28.  $A = 24, P = 24$

29.  $A = 144\pi \approx 452.39, C = 24\pi \approx 75.40$

30. *parallel*;  $\overline{AB}$  and  $\overline{CD}$

31. *perpendicular*;  $\overline{GH}$  and  $\overline{CD}$  or  $\overline{IJ}$  and  $\overline{CD}$

32.  $x = 13.86$

33.  $x = 5$

34.  $x = 15$

35.  $x = 5$