

# Geometry Honors Summer Assignment

Welcome to Geometry Honors! As we prepare for an exciting and challenging year ahead, it's important to ensure that our minds stay sharp and ready for the rigors of Geometry Honors. Strong Algebra 1 skills and knowledge of Geometry fundamentals are absolutely vital to successfully completing Geometry Honors. Comfort in the necessary skills from your previous courses will prove immensely helpful as we study examples and develop our understanding of mathematical concepts.

The intent of this assignment is to do a review of concepts to make sure you are prepared for Geometry Honors. Work through each section until you are comfortable with the content the section covers. Write **all** of your work on a separate piece of paper. **Do NOT wait until the last minute to complete this assignment!** However, you should not spend your entire summer working through these problems. Take time to relax and recharge over summer, but budget enough time so you are not rushing through this assignment. Managing your time on this assignment will play a major role in setting the tone for how you manage your time on assignments moving forward.

Try your best to complete each section. We will discuss these topics over the first few days of the year. You will be assessed on this material within the first few weeks of Geometry Honors. **Show ALL of your work.** For all *Sketch* problems, ensure your answer is written on Graph Paper. Make note of difficult problems and questions you have as you work.

Please consult the sites under "Helpful Links" **on the last page of this assignment** to aid in your review. If you have any further questions as you work through the assignment, please feel free to email me. I will check my email throughout the summer and respond to any questions you have when I am able.

Bring this assignment with you on the **2nd** day of class. I look forward to seeing you in August.

Best,

Mr. Cantlin

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## 0.1 Congruence & Similarity

1. Solve each proportion

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

b)  $\frac{6}{k} = \frac{2}{3}$

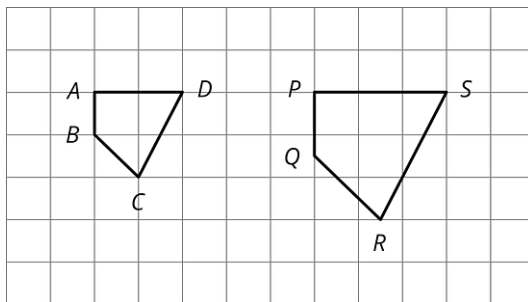
c)  $\frac{7}{n} = \frac{8}{7}$

d)  $\frac{4}{3} = \frac{8}{x}$

e)  $\frac{8}{6} = \frac{x}{3}$

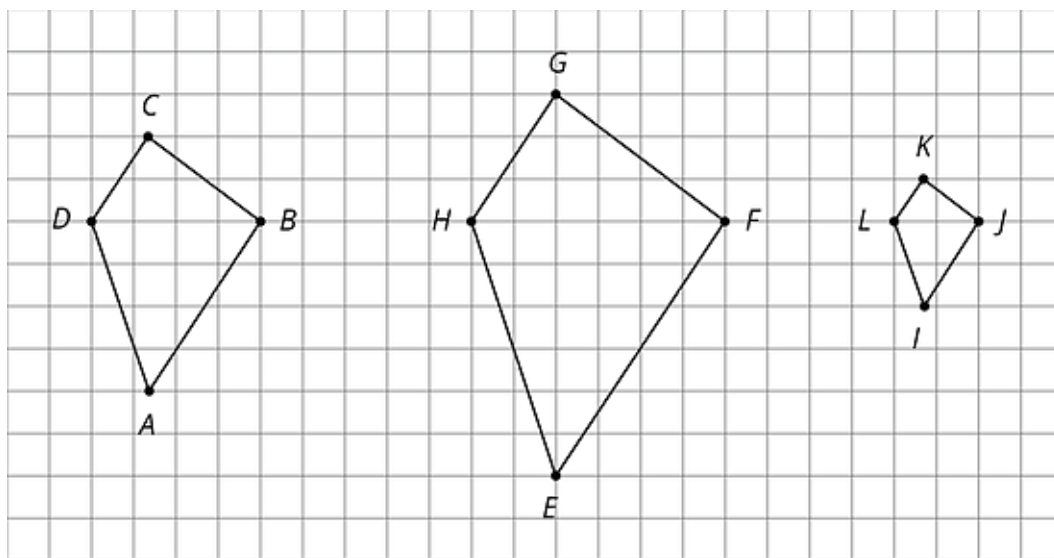
f)  $\frac{3x}{4} = \frac{12}{8}$

2. Polygon PQRS is a scaled copy of polygon ABCD



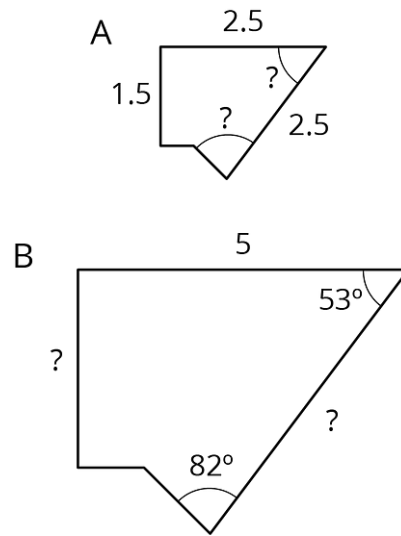
- Name the angle in the scaled copy that corresponds to angle ABC
- Name the segment in the scaled copy that corresponds to segment AD
- What is the scale factor from polygon ABCD to PQRS?

3. Each of these polygons is a scaled copy of the others



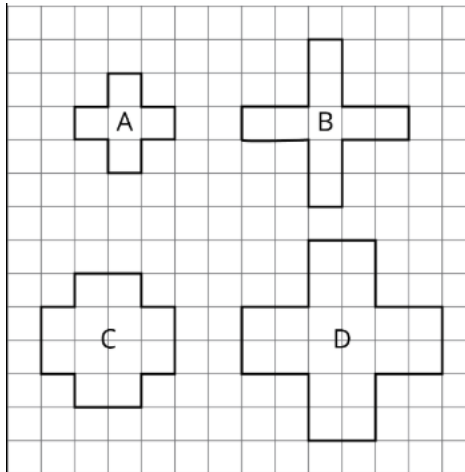
- Name two pairs of corresponding angles. What can you say about the sizes of these angles?
- Check your prediction by measuring at least one pair of corresponding angles using a protractor. Record your measurements to the nearest  $5^\circ$

4. Polygon B is a scaled copy of Polygon A

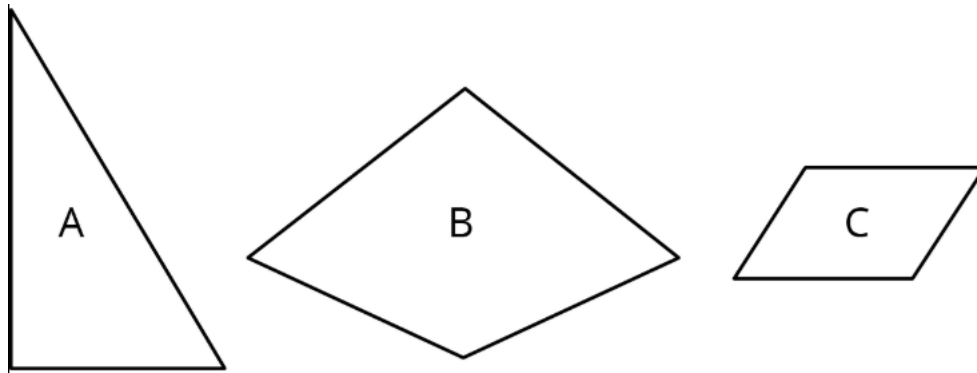


- What is the scale factor from Polygon A to Polygon B? Explain your reasoning.
- Find the missing length of each side marked with ? in Polygon B
- Determine the measure of each angle marked ? in Polygon A

5. Which figures are scaled copies of figure A?

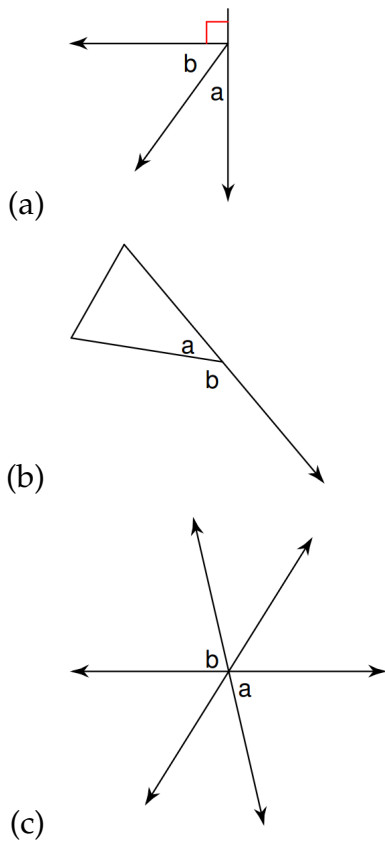


6. Here are 3 polygons

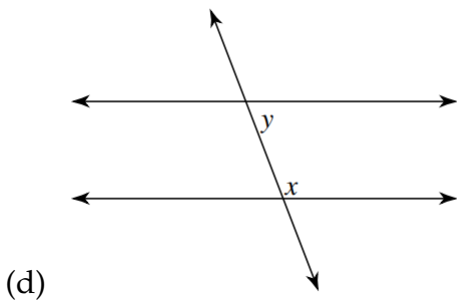
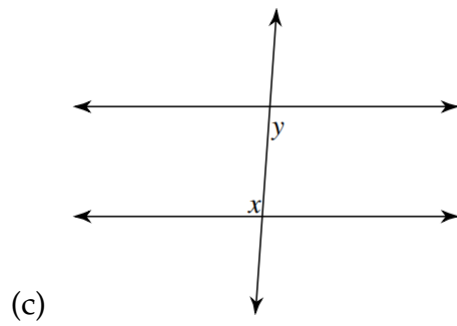
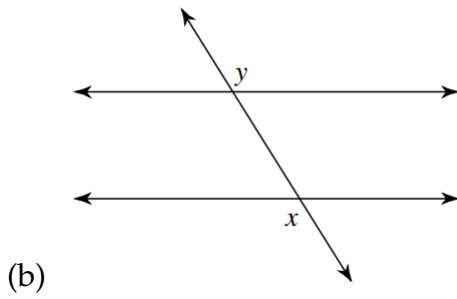
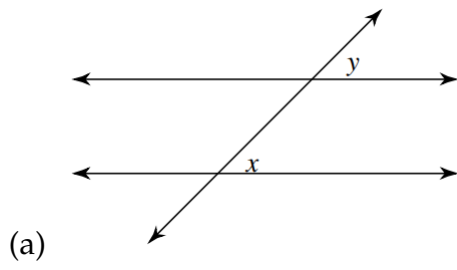


- a) Draw a scaled copy of Polygon A using a scale factor of 2
- b) Draw a scaled copy of Polygon B using a scale factor of  $\frac{1}{2}$
- c) Draw a scaled copy of Polygon C using a scale factor of 1

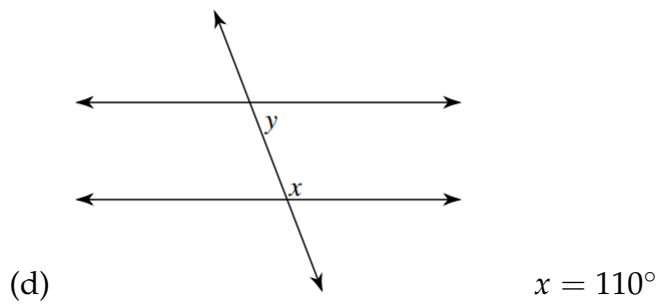
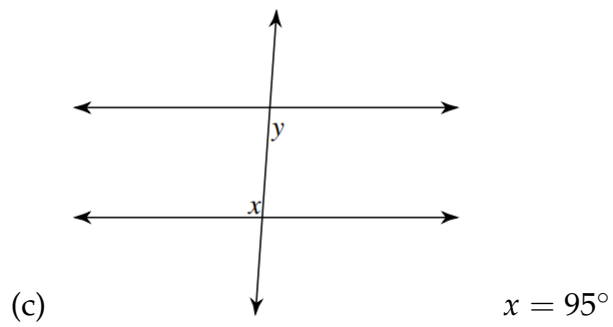
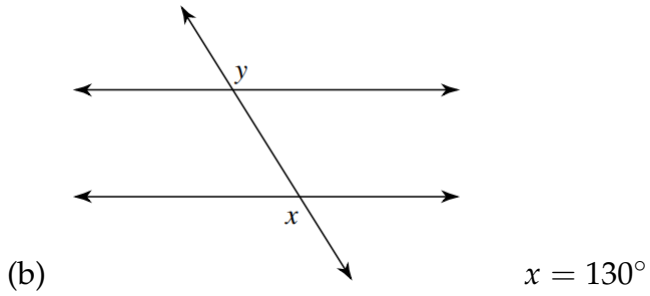
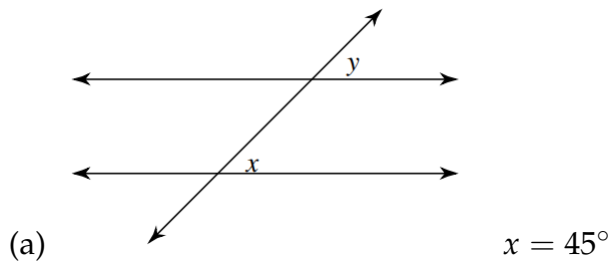
7. Name whether the angle pair relationship is vertical, complementary, or supplementary



8. Identify each pair of angles as corresponding, alternate interior, alternate exterior, or consecutive interior

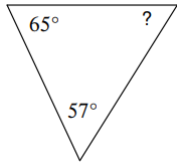


9. Find  $y$  when

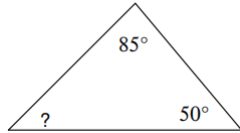


## 0.2 Triangle Trigonometry

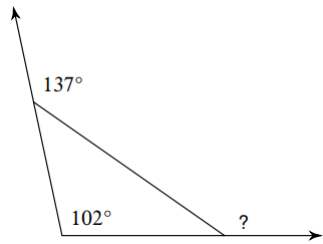
1. Find the measure of each angle indicated by a ?



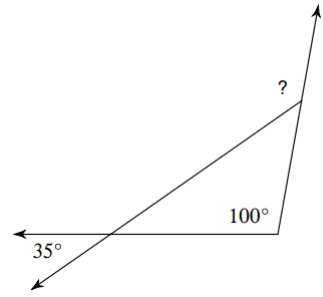
a)



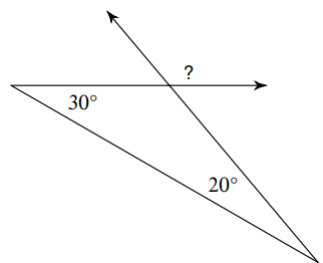
b)



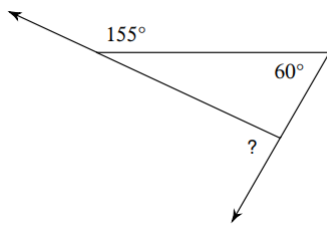
c)



d)

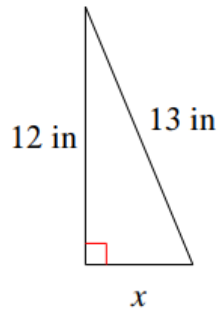


e)

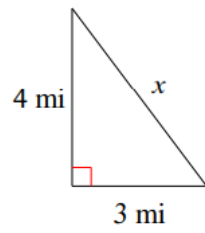


f)

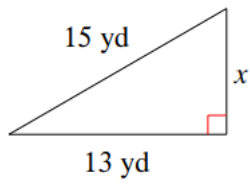
2. Use the Pythagorean Theorem to find the missing side length of each triangle



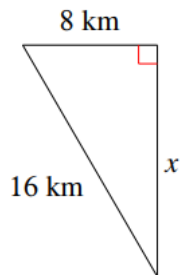
a)



b)



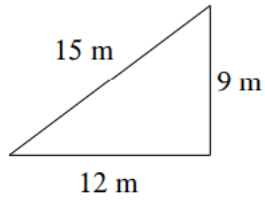
c)



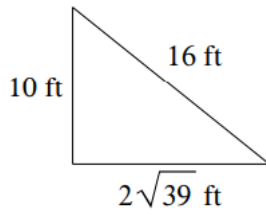
d)



3. Use the Pythagorean Theorem to verify if each triangle is a right triangle



a)



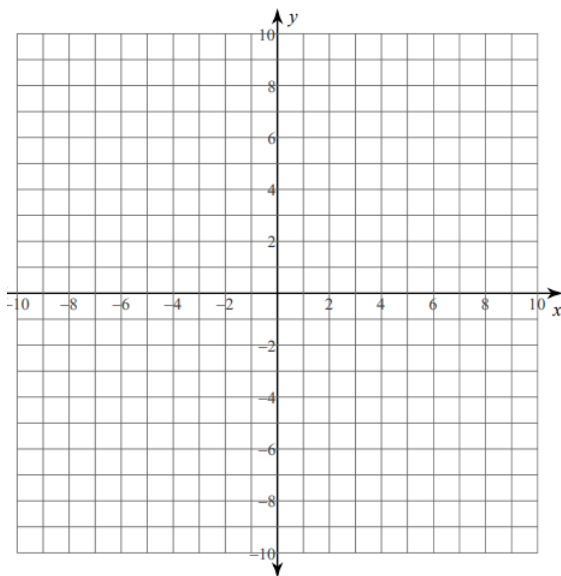
b)

- c) A triangle with side lengths 9in, 12in, 15in
- d) A triangle with side lengths 4km, 28km, 29km
- e) A triangle with side lengths 3cm, 4cm, 5cm

### 0.3 Analytic Geometry

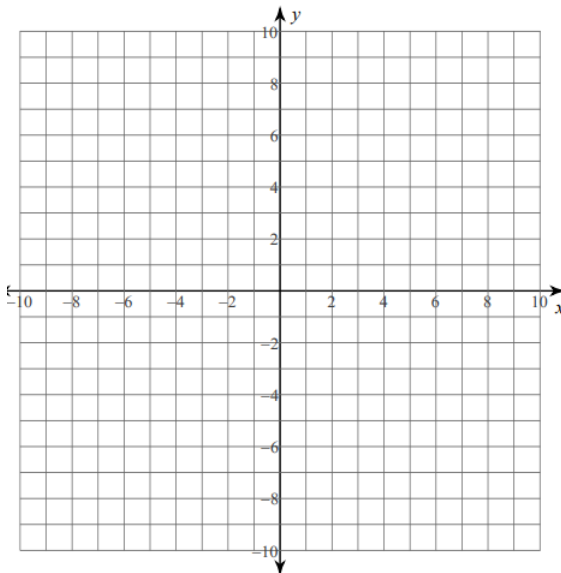
1. Plot each point

$J(5, 10)$      $I(1, 9)$      $H(6, -9)$   
 $G(-6, 8)$      $F(9, 0)$      $E(-6, 0)$   
 $D(-8, -4)$      $C(5, 0)$      $B(-1, -1)$   
 $A(-8, -1)$



a)

$A(7, 10)$      $B(0, 4)$      $C(-1, 10)$   
 $D(-6, -6)$      $E(10, 0)$      $F(9, 7)$   
 $G(-3, -4)$      $H(-4, -9)$      $I(4, 1)$   
 $J(7, -9)$



b)

2. Find the slope of the line through each pair of points

a)  $(3, -20), (5, 8)$

b)  $(15, 8), (-17, 9)$

c)  $(6, 7), (-1, 13)$

d)  $(9, 3), (19, -16)$

e)  $(6, 12), (-15, 3)$

f)  $(4, 0), (7, 11)$

3. Find the slope of each line

a)  $4x - 2y = 10$

b)  $x + 2y = -8$

c)  $3x + 5 = -4y$

d)  $-2y - 10 + 2x = 0$

e)  $x = 3$

f)  $y = 4$

## 0.4 Conic Sections

1. Factor each quadratic

a)  $b^2 + 8b + 7$

b)  $n^2 - 10n + 9$

c)  $n^2 + 4n - 12$

d)  $x^2 + 6x + 9$

e)  $3 + 6b + 3b^2$

f)  $10n^2 + 100n + 250$

2. Complete the square

a)  $x^2 + 8x$

b)  $a^2 - 12a$

c)  $x^2 - 40x$

d)  $y^2 - 24y$

e)  $p^2 - 10p$

f)  $x^2 + 7x$

3. Find the vertex of the parabola

a)  $y = 3x^2 + 12x - 12$

b)  $y = 3x^2 - 6x + 1$

c)  $y = 2x^2 - 7x + 4$

## 0.5 Circles & Solid Geometry

1. Find the area of a circle with radius

(a)  $r = 12$  in

(b)  $r = 14$  km

(c)  $r = 3$  cm

(d)  $r = 7$  m

(e)  $r = 5$  mm

(f)  $r = 8$  in

2. Now, find the circumference of a circle with radius
- (a)  $r = 12$  in
  - (b)  $r = 14$  km
  - (c)  $r = 3$  cm
  - (d)  $r = 7$  m
  - (e)  $r = 5$  mm
  - (f)  $r = 8$  in

3. Draw a picture and find the volume of

- a) A cylinder with radius 8 in and height 7 in
- b) A sphere of radius 4 cm
- c) A cone with diameter 2 mi and height 3 mi

4. Draw a picture and find the surface area of

- a) A cylinder with radius 4 in and height 6 in
- b) A cylinder with diameter 4 in and height 10 in
- c) A sphere with radius 2 m
- d) A cone with radius 6 cm and height 8 cm

### Helpful Links

<https://www.khanacademy.org/math/algebra>

<https://www.khanacademy.org/math/get-ready-for-geometry>

[https://www.stewartcalculus.com/\\_update/media/common/reviewofalgebra.pdf](https://www.stewartcalculus.com/_update/media/common/reviewofalgebra.pdf)

<https://tutorial.math.lamar.edu/Classes/Alg/Alg.aspx>

<https://www.youtube.com/@patrickjmt/playlists>

<https://www.youtube.com/@TheOrganicChemistryTutor/playlists>

Note, while these links cover the material of the review, this list is **not** exhaustive. If you are unable to find material on content you need help with, please reach out to me and I would be happy to send you additional resources.