LESSON 1-1: Points Lines and Planes

UNDEFINED TERMS OF GEOMETRY – point, line, plane

* can only be explained by examples/pictures/descriptions

**Point:** named as point P

**Line:** Named as line AB or AB; BA

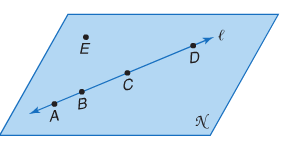
* **Collinear**: points on the \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Plane:**  named as plane P or Plane XYZ

* **Coplanar**: points on the \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Line Segment:** A line with two endpoints.

**Ray:** A line with one endpoint.

**Example 1:** Use the figure to name each of the following.

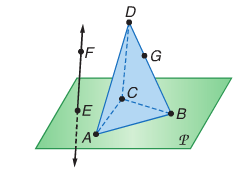
1. A line containing point *A*
2. A plane containing point C
3. Three points that are coplanar but **not** collinear.

**Example 2:** Draw and label a figure for each relationship

1. lies in a plane *Q* and contains point *R*
2. Points *A, B,* and *C* are coplanar and *B* and *C* are collinear.

**Points, Lines, and Planes in Space:**

**Space** is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ , \_\_\_\_\_\_\_\_\_\_-dimensional set of \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example 3:** Interpret the following drawing:

1. How many planes appear in this figure?
2. Name three points that are collinear.
3. Are points G, A, B, and E coplanar? Explain.
4. Name the point where FE intersects plane P.

**Example 4:** Interpret the following drawing:

a) How many planes appear in this figure?

b) Are points *A, B, C,* and *D* coplanar? Explain.

Lesson 1-3: Distance and Midpoints

**Finding Distance:**

**Number Lines**

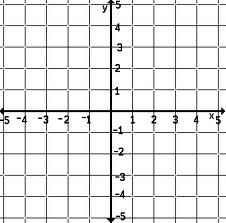
Example 1: Use the number line to find KM

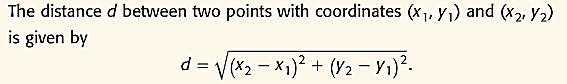
*Macintosh HD:Users:kristenrose:Desktop:Picture 40.png*

**Coordinate Plane**

­There are two methods for finding the distance between two points on the coordinate plane:

Example 2: Find the distance between R(5, 1) and S(-3, -3)

[](http://www.google.com/imgres?q=coordinate+plane&um=1&hl=en&sa=N&biw=784&bih=546&tbm=isch&tbnid=u8gKK_ic99i_pM:&imgrefurl=http://www.mathnstuff.com/papers/sheet/5x5b.htm&docid=nguSuxzhpSi0eM&imgurl=http://www.mathnstuff.com/gif/5x5plan.gif&w=337&h=334&ei=vS8gUNaeEoqLiALb04GABw&zoom=1&iact=hc&vpx=414&vpy=146&dur=1033&hovh=223&hovw=226&tx=125&ty=128&sig=100069914054327810130&page=2&tbnh=145&tbnw=146&start=8&ndsp=10&ved=1t:429,r:2,s:8,i:175) **Method 1-** Pythagorean Theorem

**Method 2 -** The Distance Formula 

**Finding Midpoints:**

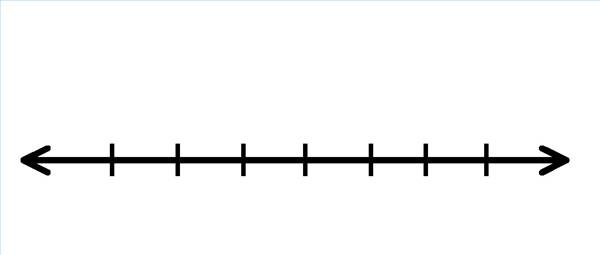
­**Midpoint of a Segment:**  The **midpoint** of a segment is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

M

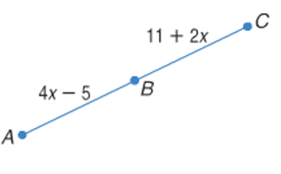
B

A



If *M* is the midpoint of , then \_\_\_\_\_\_ = \_\_\_\_\_\_\_.

**Example 3:** Find the measure of BC if B is the midpoint of .

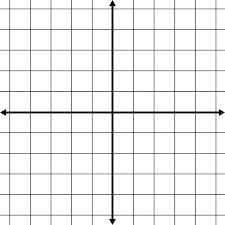


**Example 4**: Find the midpoint of -3 and 2

­

**Example 5:** Midpoint of a Line on the Coordinate Plane

Find the coordinates of *M* the midpoint of for *J*(-1, 2) and *K*(5, 0)



Midpoint Formula: ( , )

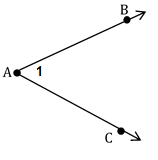
You can also find the coordinates of the endpoint if you are given the coordinate of the other endpoint and the midpoint.

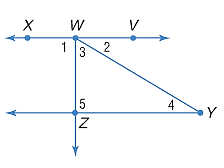
Example 7: Find the coordinates of X if ***Y*(-1, 6) is the midpoint** of XZ and Z has the coordinates (2, 8)



Lesson 1-4: Angle Measure

- An **angle** is formed by two rays that have a common endpoint. The rays are called the sides of the angle. The common endpoint is the \_\_\_\_\_\_\_\_\_\_\_\_.





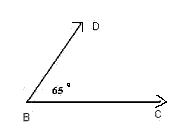
Example 1:

1. Name all angles that have *W* as a vertex.
2. Name the sides of 1
3. Write another name for WYZ



To measure an angle you can use a *protractor*. Angle DBC is a 65 degree (65°) angle.

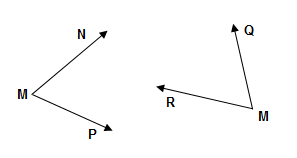
We say that the *degree measure* of DBC is 65 or \_\_\_\_\_\_\_\_\_\_\_ = 65



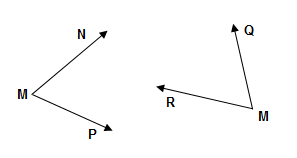
Types of Angles:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Right angle | Acute angle | Obtuse angle |
| Measure |  |  |  |
| Model |  |  |  |

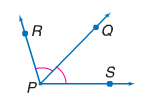


**Congruent Angles** are angles that have the \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

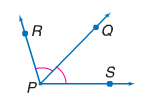
NMP \_\_\_\_\_ QMR

****Example 2: NMP≅ QMR. If m NMP = 6x + 2 and mQMR = 8x – 14, find the actual measurements of NMP and QMR.

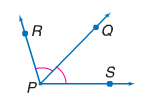
A ray that divides an angle into two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles is called an \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (fyi—a line segment can also bisect an angle)



If **bisects** , then…

Example 3: **bisects** .

a. m. Find m.

b. m. Find m.

Lesson 1- 5/1.6: Angle Relationship

**Angle Pairs….**

**(1) Adjacent angles** are two angles that lie in the \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_, have a

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ and a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_, but NO \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

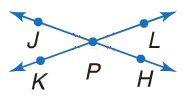
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ points.

Examples: NONexamples:

**(2) Vertical Angles** are two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles formed by two

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lines.

Examples: NONexamples:

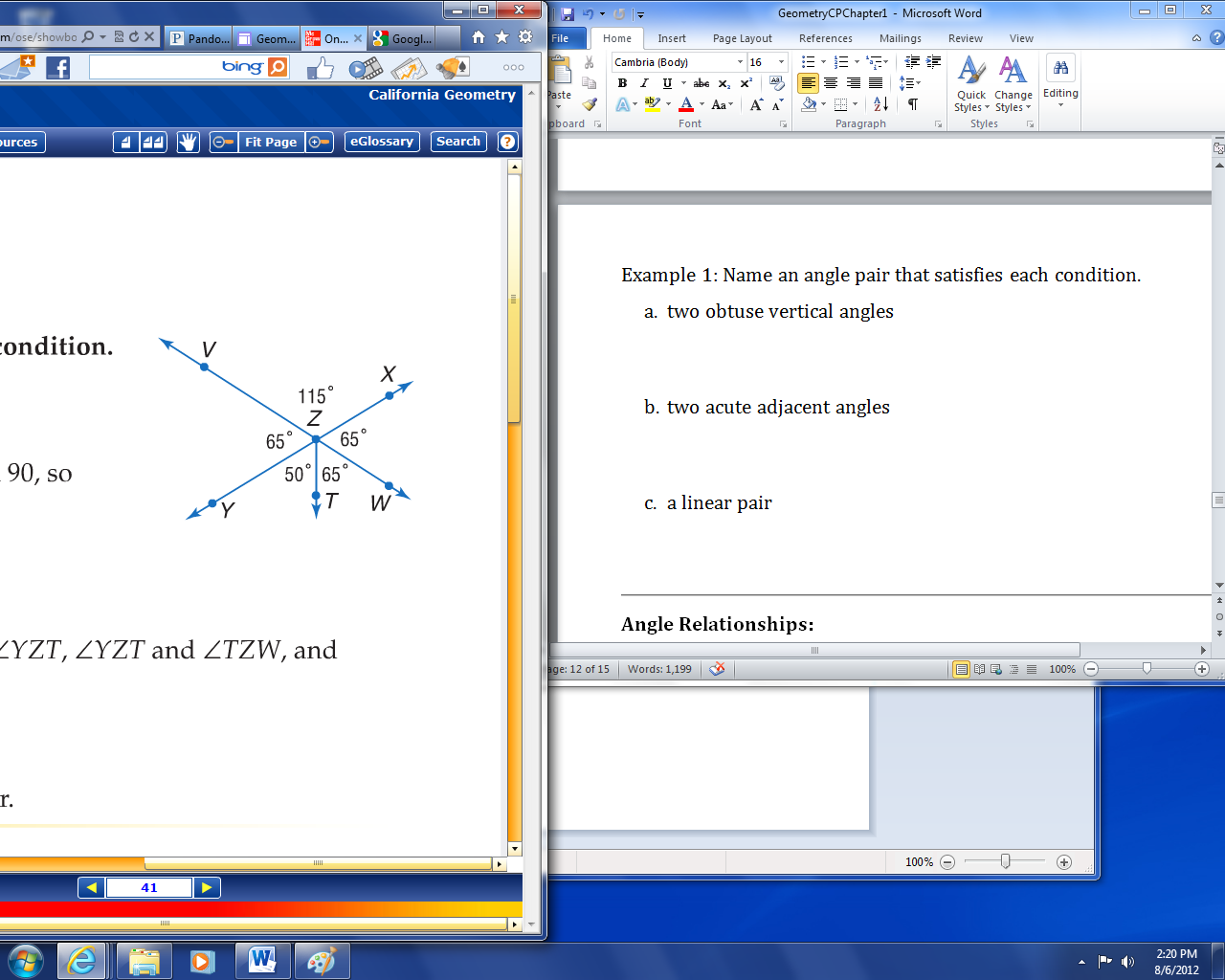
* Vertical angles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* In the figure:

**(3)** a **linear pair** is a pair of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sides

that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rays.

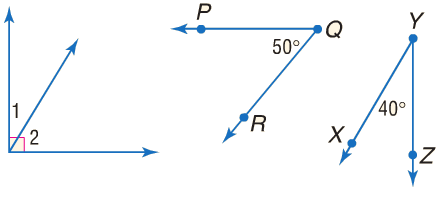
Examples: NONexamples:

Example 1: Name an angle pair that satisfies each condition.

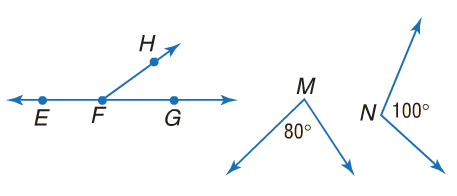
1. two obtuse vertical angles
2. two acute adjacent angles
3. a linear pair



**Special Angle Relationships:**

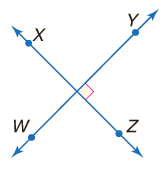
**(1) Complementary angles** are two angles with measures that have a sum of \_\_\_\_\_\_. Remember: It is always \_\_\_\_\_\_\_\_\_\_\_\_\_ to give a compliment!!!!!

**(2) Supplementary angles** are two angles with measures that have a sum of \_\_\_\_\_\_\_\_.

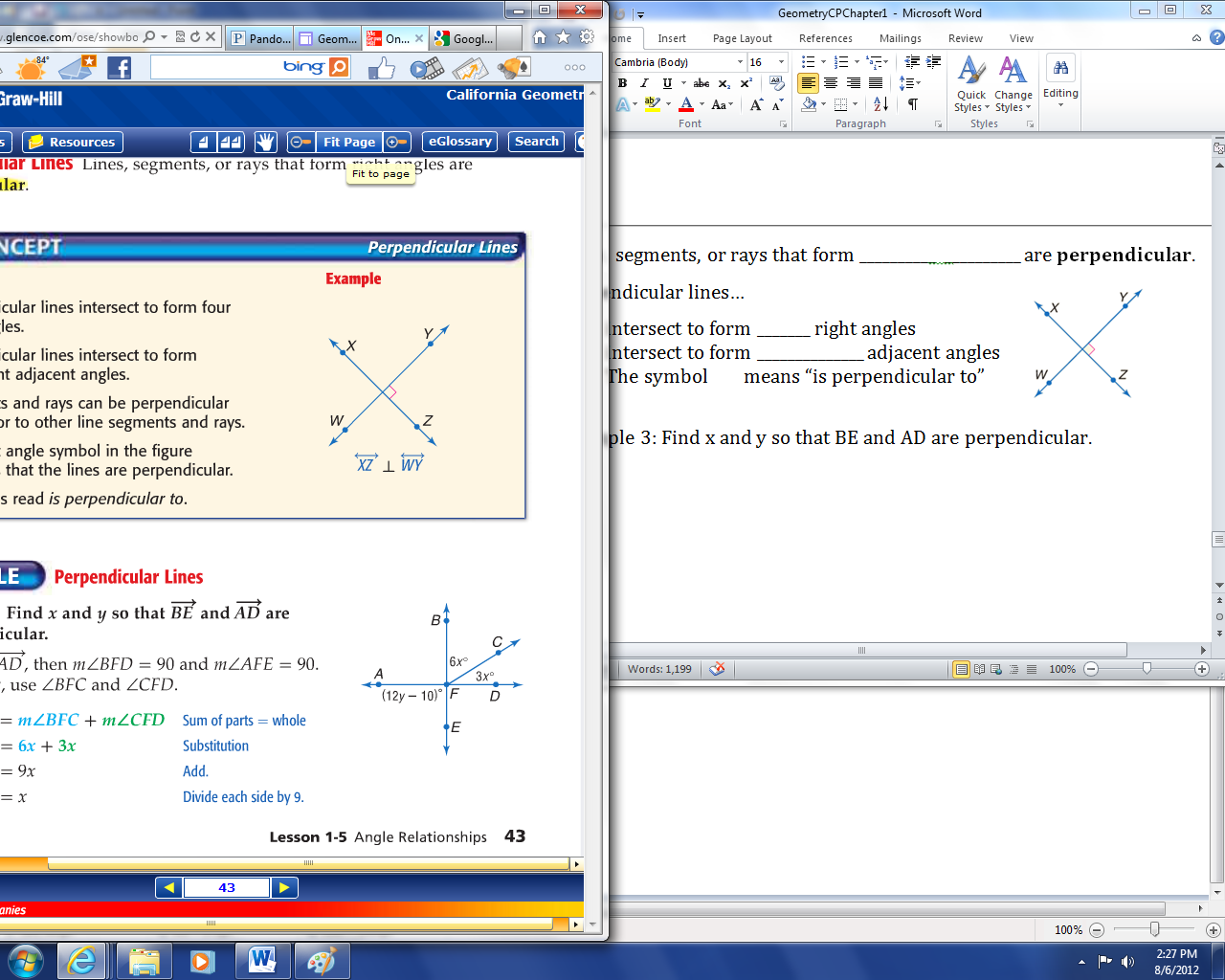


Example 2: Find the measures of two complementary angles if the difference in the measures of the two angles is 12.

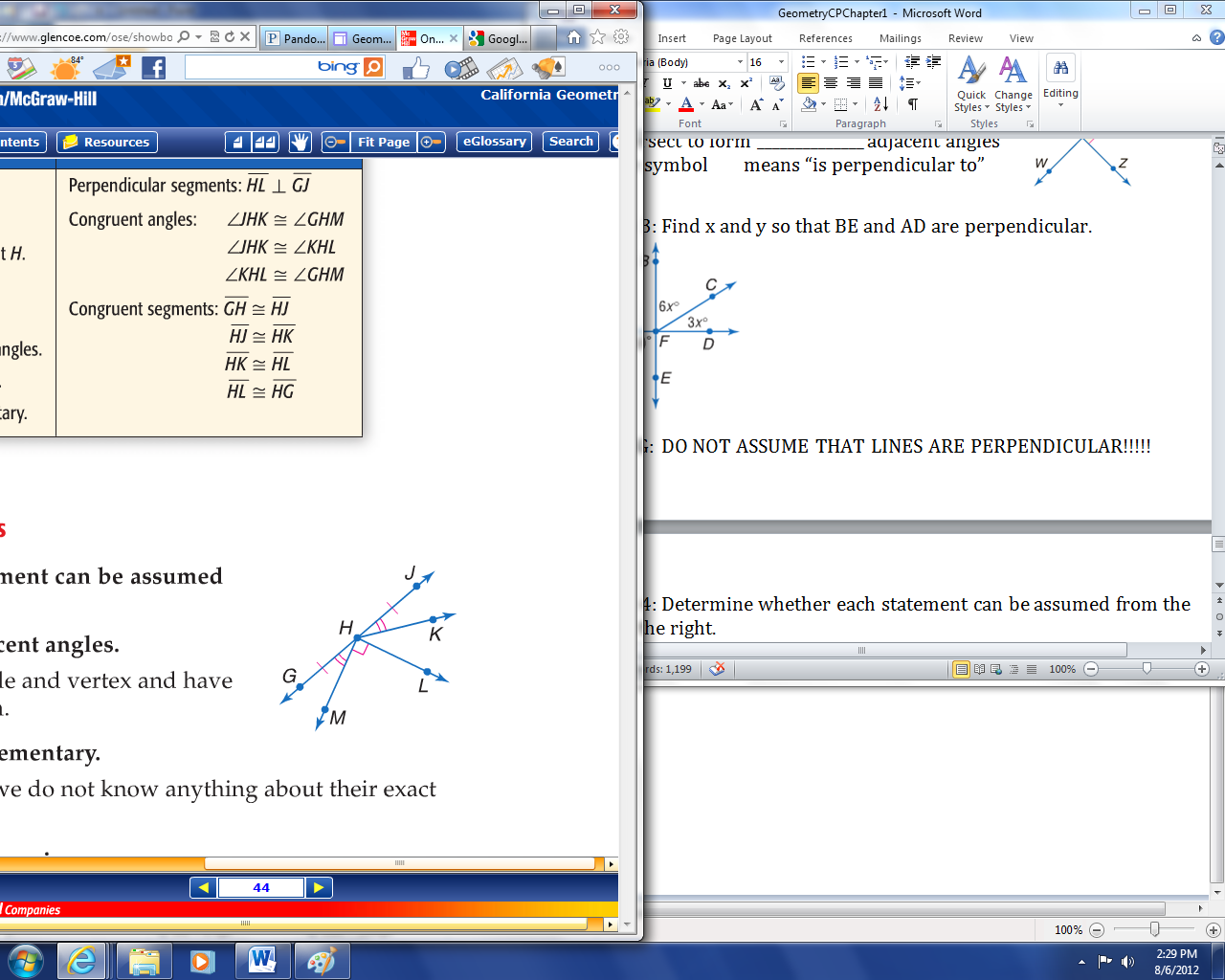
Lines, segments, or rays that form \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ are **perpendicular**.

Perpendicular lines…

* intersect to form \_\_\_\_\_\_\_ right angles
* The symbol means “is perpendicular to”

Example 3: Find x and y so that BE and AD are perpendicular.

WARNING: DO NOT ASSUME THAT LINES ARE PERPENDICULAR!!!!!

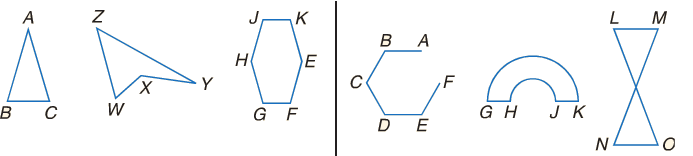
Example 4: Determine whether each statement can be assumed from the figure at the right.

1. *GHM* and *MHK* are adjacent angles.
2. *KHJ* and *GHM* are complementary.
3. *GHK* and *JHK* are a linear pair.

**Lesson 1-6: Two-Dimensional Figures**

A **polygon** is a \_\_\_\_\_\_\_\_\_\_\_\_ figure whose sides are all \_\_\_\_\_\_\_\_\_\_\_.

**Polygons**  **NOT polygons**



Rules for defining a polygon:

1. The sides that have a common endpoint are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Each side intersects exactly \_\_\_\_\_\_ other sides, but only at their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

­Naming a polygon:

A polygon is named by the letters of its vertices, written in order as you go around the figure.

Polygons can be convex or concave. If you draw a line through all the sides of a polygon, if **any** of the lines pass through the interior of the polygon, then it is **concave**. Otherwise it’s **convex**.

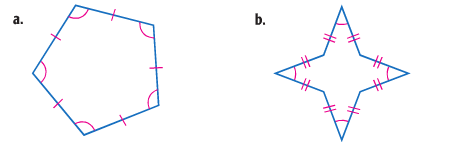
You know some polygon names – can you think of any?

In general, we classify polygons by the number of sides they have. A polygon with *n* sides is an ***n-*gon.**

|  |  |  |  |
| --- | --- | --- | --- |
| # Sides | Polygon | # Sides | Polygon |
| 3 |  | 8 |  |
| 4 |  | 9 |  |
| 5 |  | 10 |  |
| 6 |  | 11 |  |
| 7 |  | 12 |  |

A convex polygon in which all the sides AND angles are congruent is called a **regular** polygon.

Example 1: Name is each polygon by its number of sides. Then classify it as *convex* or *concave* and *regular* or *irregular.*

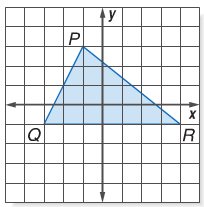


|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Triangle | Square | Rectangle | Circle |
| **Perimeter/ Circumference** |  |  |  |  |
| **Area** |  |  |  |  |

**Perimeter and Area on the Coordinate Plane**

Example 3: Refer to PQR with vertices P(-1, 3), Q(-3, -1), and R(4, -1)

1. Find the perimeter of PQR



1. Find the area of PQR