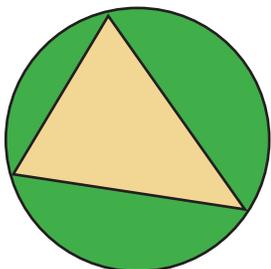
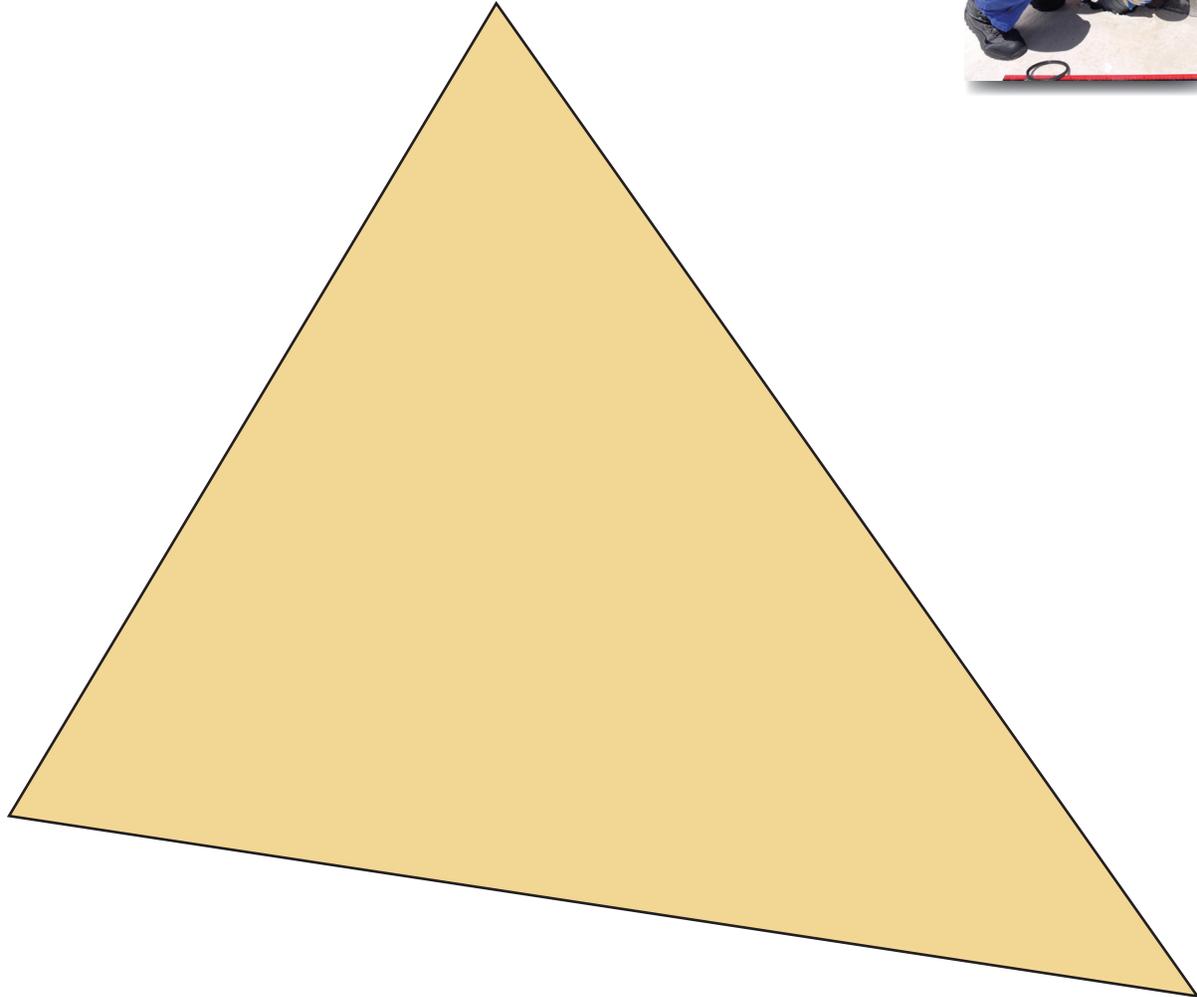


## How to Construct a Perpendicular to a Line (Cont.)

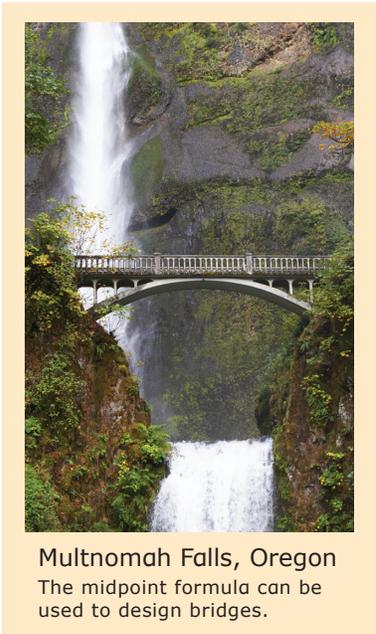
Construct a perpendicular **line** to each side of this triangle. Find the intersection of the three perpendicular **lines**.

This point of intersection (or point of concurrency) is called the **circumcenter**.



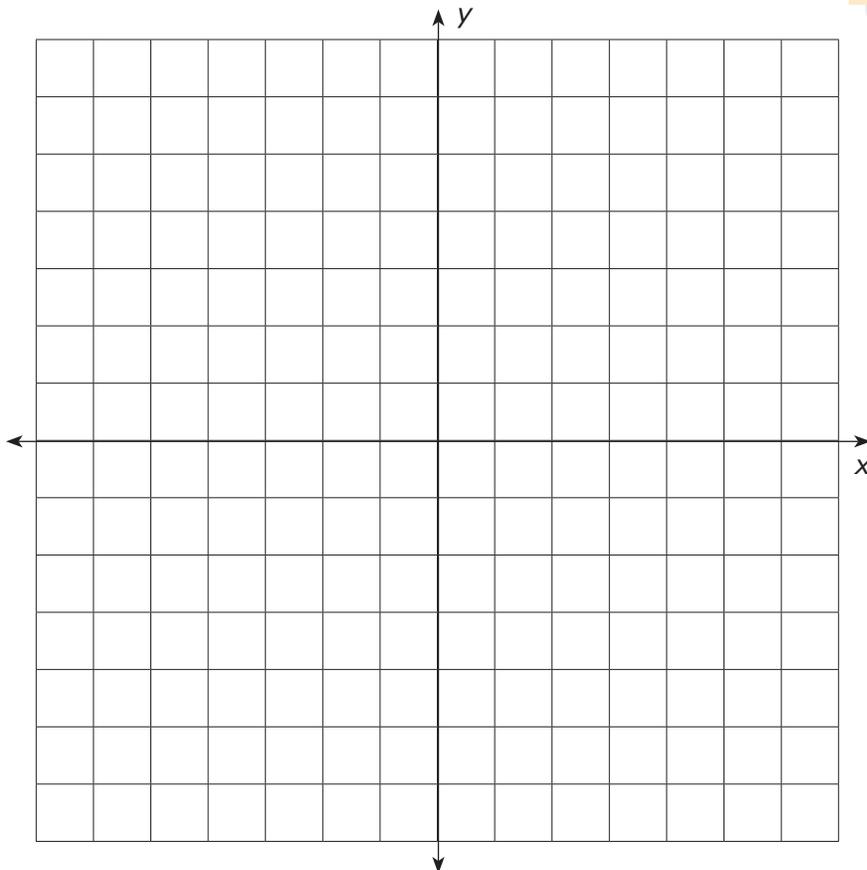
Using the circumcenter as your center, construct a circle that circumscribes the triangle as shown here.

## The Midpoint Formula (Cont.)



4 A line segment has an endpoint at  $(-4,4)$  and a midpoint at  $(-1,4)$ . Find the other endpoint. Use a grid to help you.

5 Segment  $\overline{AT}$  has endpoint **A** at  $(-6,-5)$  and midpoint **M** at  $(-1,-4)$ . Find the coordinates of **T**. Graph your results below.



6 Without graphing, can you explain how you would find the coordinates of endpoint **L** in segment  $\overline{PL}$ ? The endpoint **P** is at  $(-13,15)$  and the midpoint of  $\overline{PL}$  is at  $(3,-4)$ . Find the coordinates of point **L**.

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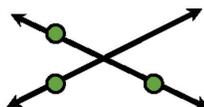
# Answers

## Chapter 1: Notation Practice, p. 3

1.  $\cong$
2.  $=$
3.  $\cong$
4.  $\cong$
5.  $=$
6.  $\parallel$
7.  $\perp$
8.  $\perp$
9. Yes, if angles are congruent, then degree measures are equal.
10. Yes, in a plane if a line is perpendicular to one of two parallel lines it is perpendicular to the second line.
11. Because there is more than one angle with point A as the vertex.

## Chapter 1: Build It!, p. 6

1. a. yes
2. a. yes  
b. Because when you have two intersecting lines you have three non-collinear points. See drawing:



3. No, it's not possible for two planes to be skew since planes go on forever in all directions. Either planes are parallel or they intersect.
4. A line.
5. The wheel on a paddle boat is one of many examples.
6. Three planes in space can intersect in 0 points, 1 common line, 2 parallel lines, 1 common point, or they can coincide.

## Chapter 2: Angles Activity, p. 9

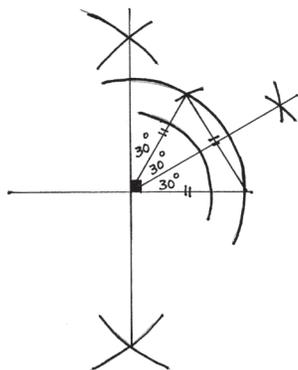
Answers to the table:

	Right	Acute	Obtuse	Straight	Adjacent to $\angle ECD$
$\angle FCE$		✓			✓
$\angle ECD$		✓			
$\angle DCA$				✓	✓
$\angle FCB$			✓		
$\angle BCD$	✓				✓
$\angle ACB$	✓				

9. b. The orthocenter is outside the triangle in the obtuse triangle shown.
10. a. A right triangle.  
b. A right triangle.  
c. A triangle inscribed in a semicircle is always a right triangle.
11. You can construct a square inscribed in a circle and then bisect all four sides. Where the bisectors intersect the circle are new vertices that you can join with the existing vertices to construct an octagon.
12. a.  $108^\circ$ . The formula is  $((n - 2)180^\circ) \div 5$  where  $n = 5$   
b. Bisect each side and where the bisectors intersect the circle are new vertices that can be joined with the existing vertices to construct a decagon.

**Impossible Constructions?, pp. 122-132**

1. The center angle will not be congruent to the two outside angles.
2. Draw a perpendicular bisector to create a right angle, then using your compass from the vertex of the  $90^\circ$  angle, draw an arc. Without closing or opening your compass, go to one side where the arc intersects the side of your  $90^\circ$  angle and make a marking on that arc to mark the same length. You have now created an equilateral triangle inside your right angle. Inside your right angle is a  $60^\circ$  angle, bisect it. You have now trisected the  $90^\circ$  angle since the remaining angle outside of the equilateral triangle and inside the right angle is  $30^\circ$ .



**Chapter 9: The Geometry of Three Dimensional Shapes, p. 124**  
**3D Shapes - Prisms, pp. 125-126**

1. 6 cm
2. It looks like 512 to the 13th power! Correct way: 512 cubic ft or 513 ft<sup>3</sup>
3. 1,008 cu cm  $\frac{[4(6 + 12)]}{2} (2)(14)$
4. 250 cu m; (50)(5)
5. 5,700 cu ft; Rectangular prism: 3,000 + Triangular prism: 2,700.  
[Triangular prism is  $2,700 = \frac{(18)(12)}{2} (25)$ ]
6. 19 cu in. Outside cube: 27 - inside cube: 8
7. Both have a volume of 200 cu in.