

Geocaching in the Classroom

nzimmerm@access.k12.wv.us

Math Puzzles

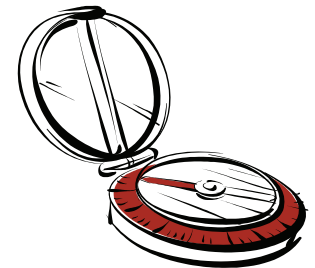
N 39* AB.CDE, W 78* FG.HIJ

3	5	A				7		6
	8	6		B		9	5	
			C	5			2	
			D	9	6			G
9	E	8				6		2
			8	3	F			
	3			7	H			
	4	9	I			1	8	
6		1			J		4	3

C	/		-		-7
-		+		+	
	-	D	-		-3
X		-		+	
B	/	A	-	E	0
-22		9		13	



Vectors—described by both a magnitude and direction



Brunton Map and Compass Curriculum

Heading—the direction an object or person is facing or pointing

Bearing—clockwise angle from North and the direction to an angle

<http://www.geocaching.com>

Navigation Problems

Example A: A large light post is located at the cache listing coordinates. This is Point A. Another light post is located along the same side of the soccer field. This is Point B. Using the GPSr, measure the distance and bearing between Points B and A. Point C is [N39 21.638 W76 57.182]. The cache is located at Point D. Point D is related to Point C by bearing and distance. The relationship is: 'Point D is to Point C' as 'Point B is to Point A'. The cache is located in the woods, not far from the edge of the field. The field is infrequently mown, so the grass is sometimes high. DON'T BUSHWACK. Follow the left side of the field and LOOK FOR A TRAIL OPENING that is near the cache. The trail opening is located, relative to Point C,

Example B: A pilot sets out from an airport and heads in the direction N 20° E, flying at 200 mi/h. After one hour, he makes a course correction and heads in the direction N 40° E. Half an hour after that, engine trouble forces him to make an emergency landing.

- Find the distance between the airport and his final landing point.
- Find the bearing from the airport to his final landing.

Puzzle Cache: Heron's Formula Application



Heron of Alexandria (c. 100 BC) was a Greek geometer and inventor. His works describe how to find the areas of triangles, quadrilaterals, regular polygons having 3 to 12 sides, and circles as well as the surface areas and volumes of three-dimensional objects. His formula for the area of a triangle states: Given any triangle with sides a , b , c , the area of the triangle is the square root of $(s * (s-a) * (s-b) * (s-c))$ where $s=(a+b+c)/2$.

Puzzle Cache: Logic

There are five cachers with five different GPSrs. In each house lives a single cacher. These five owners collect a certain item, drive a certain vehicle and keep a certain pet. No cacher has the same pet, collects the same item, owns the same gps device or drives the same vehicle.

Supposedly, Albert Einstein wrote a similar riddle, and said 98% of the world could not solve it.

1. Robert is the Garmin owner.
2. DaisyChain keeps dogs as pets.
3. Snurt collects GeoCoins.
4. The Etrex owner is on the left of the Map60cs owner.
5. The Etrex owner collects WG\$.
6. The person who drives the Truck rears birds.

7. The owner of the Sportrak drives a Jeep.
8. The person living in the house right in the center collects FTF Prizes.
9. The truck owner lives on the left of the Cacher that keeps fish.
10. Phideo lives in the first house.
11. The cacher who drives a 4X4

- lives next to the one who keeps cats.
12. The cacher who keeps horses lives next to the cacher who drives a Jeep.
13. The owner of the Bike collects Sig Items.
14. Rthwrm drives a Car.
15. Phideo lives next to the Meridian owner.
16. The cacher who drives a 4X4 has a neighbour who collects Travel Bugs.

Who owns the Meridian?

Puzzle Cache: Geometric Application

Center of the Triangle: To determine the location of the cache, find the center of the triangle that is formed by the intersection of the three line segments determined by the three line segments below.

