The lines $BH$ and $CL$ are parallel. Refer to the diagram above when answering the questions on this page.

1. [3] TRUE/FALSE: If true, circle T and explain briefly why the statement is true. Otherwise, circle F.

T  F  $\angle AEB$ has the same measure as $\angle LJK$

Alternating exterior angles are congruent since $BH \parallel CL$

T  F  $\angle AEB$ has the same measure as $\angle DEH$

2. [1] Find a pair of angles that are alternate interior angles.

$\angle BFE$ and $\angle EFS$

$\angle HFE$ and $\angle EFL$

3. [1] Fill in the blank: If a line $l$ was perpendicular to line $BH$, then $l$ would be perpendicular to $CL$. 

1
4. Angles $\angle ADB$, $\angle BDC$ and $\angle ABC$ are right angles in the diagram below. Use this diagram to answer the questions below.

(a) [1] Identify two triangles that are similar

$$\triangle ABC \sim \triangle ADB \sim \triangle BDC$$

(b) [1] Find the length of $BD$

Given $\angle A$ is right, so

$$3^2 + (BD)^2 = 5^2$$

$$9 + (BD)^2 = 25$$

$$BD^2 = 16$$

$$BD = 4$$

(c) [2] Find the length of $DC$.

Since $\triangle A$ ~ $\triangle D$,

$$\frac{BD}{AD} = \frac{DC}{BD}$$

$$\Rightarrow \frac{4}{3} = \frac{DC}{4}$$

$$\Rightarrow DC = \frac{16}{3}$$

5. [2] Write down a conditional statement that is true but has a false converse.

If an object is a square, then it is also a rectangle. But

If an object is a rectangle, then it is a square. May not be true.

6. [2] Logic, as written by Aristotle in 384 BC (and discussed in class on 1/5), had three rules. Write down one of the rules.

1) Identity "a spade is a spade"

2) Excluded middle: statements have to be true or false

3) Statements cannot be both true and false.

7. [2] What trait about the cult of Pythagorus do you find the most interesting?

I think it is interesting that they thought the planets each had their own musical note and thus originated the 'music of the spheres' idea. Although the idea to kill a man to hide the existence of irrational numbers is also interesting.