# Geometry Homework #22

1) Given: Points F, J, I, and G are on the same line, points B, D, F, and A are all on the same line, points B, E, G, and C are on the same line, point I is between H and C, point I is between J and G, point G is between E and C, point J is between A and H, point D is between A and B, point F is between A and D, point E is between B and C, $\overline{DE}$ P$\overline{FG}$, $\overline{AE}$ and $\overline{DC}$ intersect at point H, $\angle DEH \cong \angle HIJ$, $\angle A \cong \angle C$, $\overline{DC}$ is not congruent to $\overline{DA}$
   Prove: $\overline{AE}$ is not congruent to $\overline{CD}$
2) Andrew, Derek, Jacob, Abigail, and Chloe went on a trip to the zoo. All five students have five different favorite animals that they want to see: monkeys, alligators, bears, lions, and giraffes. Each of the five students ate one of the five different things as a snack: popcorn, potato chips, pretzels, nacho chips, or crackers. Each student bought one souvenir: a stuffed rabbit, a lion t-shirt, a key chain, a plastic snake, or a stuffed monkey. From the following clues, which student likes which animal, who ate what for a snack, and who bought what as a souvenir. One of the students got so excited to see their favorite animal, the alligators, that they spilt their popcorn all over the place. Chloe really didn't want to see the alligator exhibit because she doesn't like reptiles or anything that has scales. The stuffed monkey got covered in nacho crumbs from its owner's hugs. After visiting the zoo, Andrew kept making lion noises, even in his sleep! Abigail and Jacob both got a snack that involved chips. The student who bought the t-shirt loved it so much that he slept in it despite pretzel crumbs getting into his bed. The nacho lovers' favorite animal is the monkey, which is why they wanted to go that exhibit. None of the boys bought a stuffed animal. The student who got the keychain picked the one with their favorite animal, the alligator, on it. One of the girls just loved the new bear exhibit. It was her favorite part of the day.
3) Given: $\Delta ABC$, $\overline{BD}$ is both an altitude and a median of $\Delta ABC$, point E is between B and D, $\angle AEB \cong \angle CEB$
   Prove: $\overline{AB} \cong \overline{CB}$
4) Using nothing more than a straightedge and a compass, construct a triangle, of any shape and size, bisect each of the three angles, and find the point where all three bisectors intersect each other. What is special about this particular point?
5) Given: $\Delta ABC$, $\overline{BD}$ is a median of $\Delta ABC$, points E, A, D, C, and F are all on the same line, A is between E and D, C is between F and D, $\angle EAB$ is not congruent to $\angle ECB$
   Prove: $\overline{AB}$ is not congruent to $\overline{CB}$
6) Prove: $-9^0 - 4(-3-2) - 2^3 - 12 \div 4(-2-1) - 5$ is 15
7) Prove: If point A is (–22, 4), B is (2, –14), C is (–11,12), and D is (17,– 9) then line AB is parallel to line CD
8) Prove: If $-3x - 2^4 - 3(4x-1) - 24 \div 6(-1-3) = -6x - 4(6-9)^2 - 2(-5x+7)$ then $x = \frac{53}{19}$
9) Prove: If point A is (2,2), B is (5,7), and C is (8,2) then ABC is an isosceles triangle
10) Prove: If point A is (16,-1), B is (-8,8), C is (-6,-20), and D is (3,4) then line AB is perpendicular to CD
11) Prove: If point A is (6,10), B is (0,-5), C is (10,-9), and D is (-10,-1) then segment AB is both an altitude and median of triangle DAC

12) Prove: $-2(-4-3)^0-8\div 4(-1-1)-4^2-\sqrt[3]{64}-3^4$ is $-99$

13) Prove: If point A is (–13, –5), B is (–3, 2), C is (–7,–9), and D is (13,–2) then angles ABC is congruent to angle DCB

14) Prove: If $-3(-4x-5)-54\div 6(-2-7)-9x=-3^3-3(-6x-4)-2(-2-1)^3-\sqrt[3]{343}-4x$ then $x=\frac{64}{11}$

15) Prove: If point A is (2,4), B is (11,-8), and C is (-10,-5) then ABC is a right, isosceles triangle

16) Prove: If point A is (-5,3), B is (0,-4), C is (-7,-6), D is (-11,4), E is (4,6), and F is (-2,1) then angle EAB and angle DFC are congruent.

17) Prove: $\sqrt[5]{32}-3|4-6|-1^7-12\div 3\div(-3-1)-2^6$ is -67

18) Prove: If point A is (-2,-10), B is (-12,5), C is (4,7), D is (-8,-1), and E is (-4,-7), then the area of triangle ABC is 130 and the area of triangle AEC is 26.

19) Prove: If point A is (-14,-4), B is (-4,10), C is (12,8), and D is (2,-6), then angle BAD and angle DCB are congruent.

20) Prove: If $8x-72\div 9(-7-1)-3(-5x+7)^0-13x=-5x(-1-2)^2-4^2-\sqrt[5]{243}-3(-7x-8)-2^4$ then $x=\frac{-72}{19}$