Math 206 - Test 3

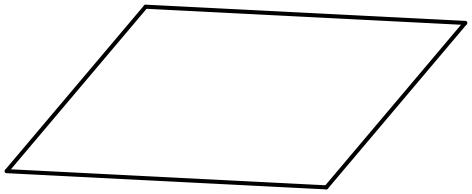
Name _____

November 17, 2010

Score _____

Show all work. Supply explanations when necessary.

1. (3 points) The figure shown below is a parallelogram. Choose any two consecutive interior angles. Label them A and B. Then provide a convincing argument that $\angle A$ and $\angle B$ are supplementary.

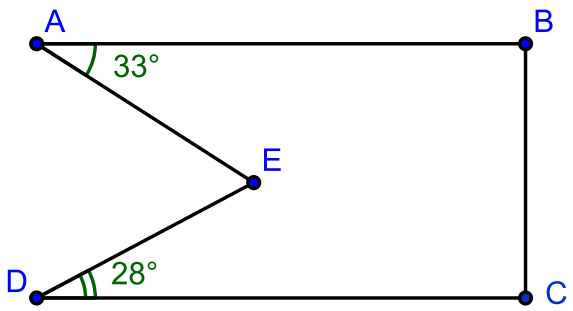


2. (3 points) What is the measure of each interior angle of a regular heptagon? What is the measure of each exterior angle?

3. (2 points) What is a scalene triangle?

4. (1 point) What is the minimum number of points in a set of noncoplanar points?

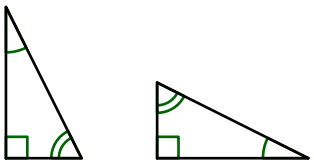
5. (3 points) In the following figure, $\overline{AB} \parallel \overline{DC}$. Find the measure of $\angle AED$. Explain your reasoning.



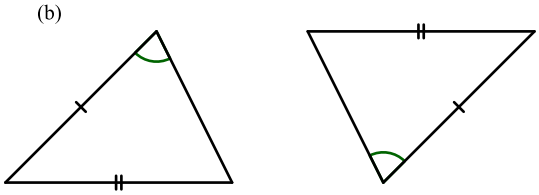
6. (3 points) Use your protractor to draw an angle that measures 75°. Then use only a compass and straightedge to bisect that angle.

7. (3 points) For each of the following pairs of triangles, determine whether the given conditions are sufficient to show the triangles are congruent. If the triangles are congruent, tell which congruence property can be used to verify this fact.

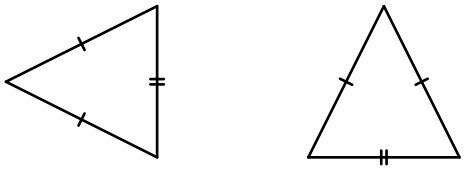
(a)



(b)



(c)

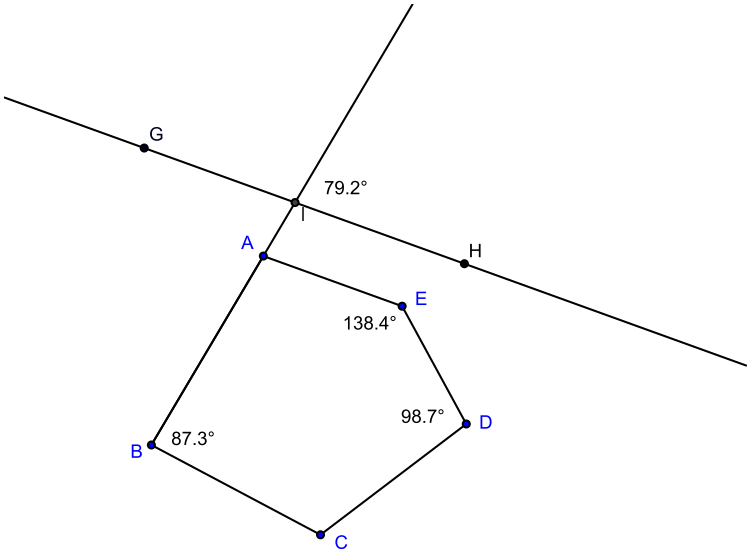


8. (2 points) What is a kite?

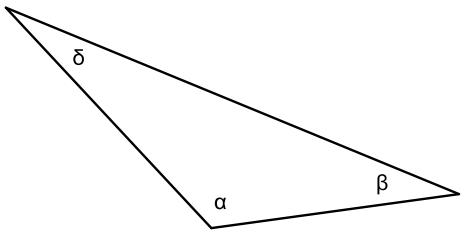
9. (1 point) Suppose that a line is taken at random from each of two parallel planes. Must the lines be parallel? Explain.

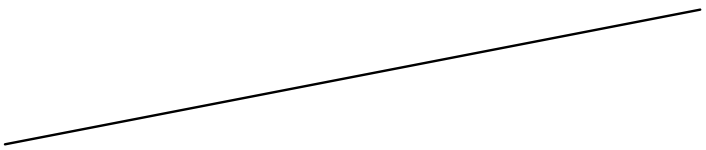
10. (1 point) What is the minimum number of points in a set of noncollinear points?

11. (3 points) In the following figure, $\overline{AE} \parallel \overline{GH}$. Find the measure of $\angle BCD$.



12. (3 points) Use a compass and straightedge to construct an angle whose initial side lies on the line below and whose measure is the same as that of $\angle\delta$.



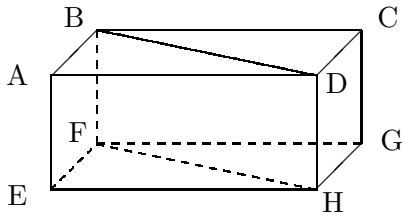


13. (4 points) $\angle ABC$ and $\angle CBD$ are adjacent angles. The measure of $\angle ABC$ is $19^\circ\, 43'\, 52''$, while the measure of $\angle CBD$ is $38^\circ\, 28'\, 47''$.

    (a) Find the measure of $\angle ABD$. Write your answer is degrees, minutes, and seconds.

    (b) Convert your answer from part (a) to degrees in decimal form.

14. (3 points) Refer to the following three-dimensional figure. Be sure to use correct notation for your answers below.

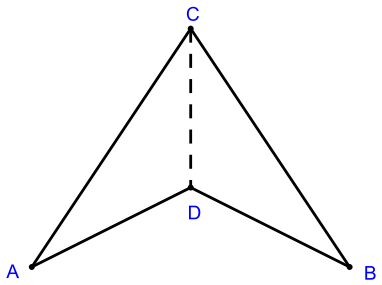


    (a) Find a pair of skew lines. (If not possible, explain why.)

    (b) Find three concurrent lines. (If not possible, explain why.)

    (c) Find three points that are not coplanar. (If not possible, explain why.)

15. (3 points) The figure shown below is a kite. Carefully explain how we can be sure that $\triangle ACD \cong \triangle BCD$.



16. (2 points) Sketch a concave pentagon.

17. (3 points) Indicate whether each statement is true or false. If false, change one word to make the statement true.

    (a) Three collinear points uniquely determine a plane.

    (b) If three lines share a single point, then the lines must be coplanar.

    (c) Two parallel lines uniquely determine a plane.

18. (4 points) Use a straightedge to draw an obtuse triangle. Then use only a compass and straightedge to construct a congruent triangle.

19. (3 points) Draw a line segment. Then use only a compass and straightedge to bisect the segment.