

Name: \_\_\_\_\_

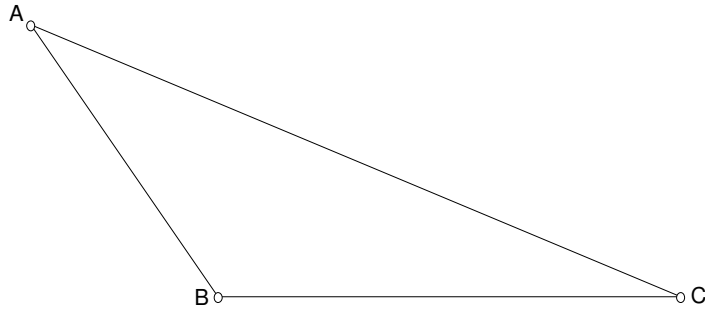
Date: \_\_\_\_\_

### Mat 153 Final

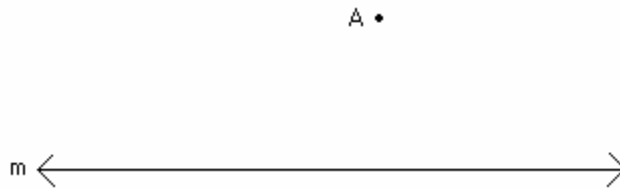
1. (12 points) Consider the following statement.
  - I will get wet if I jump into the lake.
    1. Convert the statement into an If Then statement.
    2. What is the hypothesis?
    3. What is the conclusion?
    4. What is the contrapositive?
    5. What is the inverse?
    6. What is the converse?
  
2. (5 points) Is the following argument valid? Show all work and explain your reasoning.
  - If a bird sings, then he won't be caged.
  - If a bird is caught, he will be caged.
  - Therefore, if a bird is caught, he will not sing.
  
3. (2 points) How many points on a line are five units away from point R?
  
4. (3 points) What betweenness relationship exists if  $MN = MP - NP$ ?

5. (3 points) Write the assumption with which an indirect proof of the following statement would begin.
- A bridge hand must contain more than three cards of the same suit.
6. (4 points) Draw a line containing points A, B, C and D in alphabetical order. Label all of the coordinates so that AC is 8, BD is 7 and AD is 14. (There is more than one possible answer.)
7. (3 points) B is the midpoint of  $\overline{AC}$ . Draw the line segment, label the points and all of the coordinates so that j is the coordinate of A and  $AB = 5$ .
8. (3 points) Draw a heptagon and its diagonals from one vertex.
9. (2 points) Draw angle FGH where  $\angle FGH = 95^\circ$ .
10. (2 points) Draw an angle supplementary to angle FGH in question number 9.

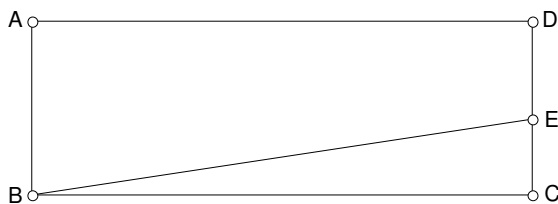
11.(5 points) Construct a copy of triangle ABC.



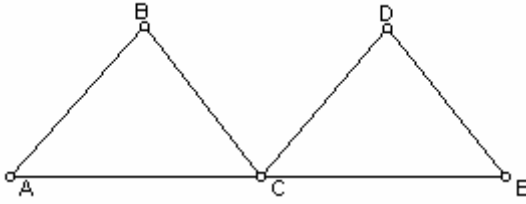
12. (4 points) Draw a line parallel to line m through point A.



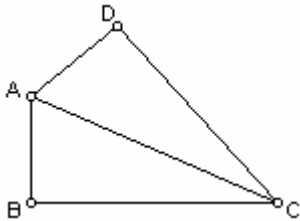
13. (4 points) ABCD is a rectangle. EC = 3; DE = 4; AD = 8 What is the area of ABED?



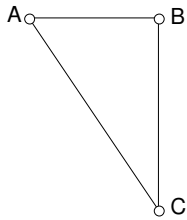
14. (4 points)  $\angle BCE = 120^\circ$ ;  $\angle A = 55^\circ$  What is  $\angle B$ ?



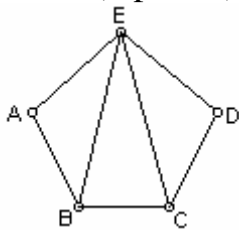
15. (4 points) Angle DAC is complementary to angle DCA.  $\angle DAC = (4x + 7)^\circ$ ;  $\angle DCA = (3x - 1)^\circ$  What is  $x$ ? What is  $\angle DAC$ ? What is  $\angle DCA$ ?



16. (4 points) Angle ABC is a right angle.  $\angle BCA = 30^\circ$ ;  $BC = 50$  What is  $\angle BAC$ ? What is  $AB$ ? What is  $AC$ ?



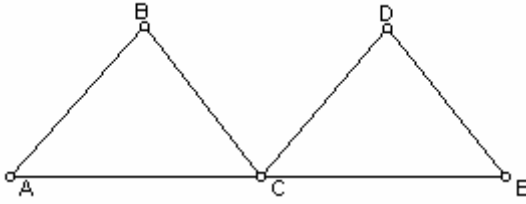
17. (6 points)



Given:  $\angle EBC = \angle ECB$ ;  $\angle BEA = \angle CED$ ;  $AE = DE$

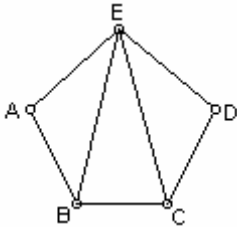
Prove: triangle BEA  $\cong$  triangle CED

18. (10 points)



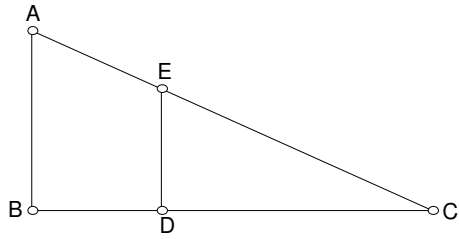
Given:  $C$  is the midpoint of  $\overline{AE}$ ;  $\angle A = \angle E$   
Ray  $CB$  bisects angle  $ACD$   
Ray  $CD$  bisects angle  $BCE$   
Prove: Triangle  $ABC \cong$  triangle  $EDC$

19. (8 points)



Given:  $AE = DE$ ;  $BA = CD$ ;  $\angle A = \angle D$   
Prove: triangle  $BEC$  is isosceles

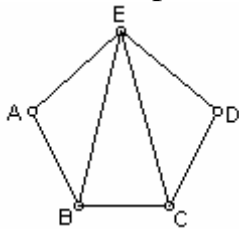
20. (10 points)



Given:  $\overline{AB} \perp \overline{BC}$ ;  $\overline{ED} \perp \overline{BC}$

Prove: triangle ABC is similar to triangle EDC

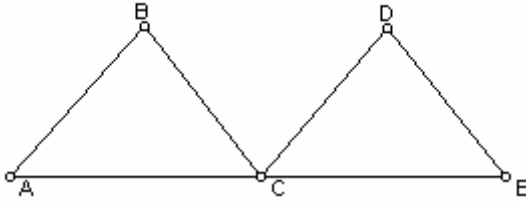
21. (10 points)



Given:  $BA = CD$ ;  $AE = DE$ ;  $EC = EB$

Prove: The perimeter of BAEC = the perimeter of CDEB

22. (10 points)

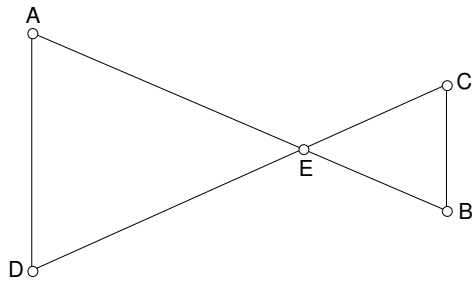


Given: triangle ABC and triangle CDB are equilateral

$$\angle D = \angle A$$

Prove:  $\overline{AB} \parallel \overline{CD}$

23. (6 points)



Given: angle AED and angle CEB are vertical angles

$$\frac{EA}{EC} = \frac{ED}{EB}$$

Prove: triangle DAE is similar to triangle BCE