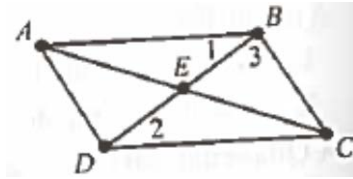


**Math 3301 Foundations of Geometry**  
**Unit II Practice Test**

Name \_\_\_\_\_

1. Refer to the figure in which ABCD is a parallelogram. True or False.

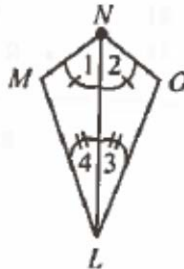


- (a)  $\overline{AD} \cong \overline{AB}$   
 (b)  $\angle 1 \cong \angle 2$   
 (c) If  $\overline{AB} \cong \overline{BC}$ , then  $\overline{AC} \perp \overline{BD}$ .

2. Write a two-column or a flowchart proof.

**Given:**  $\angle 1 \cong \angle 2$ ;  $\angle 3 \cong \angle 4$

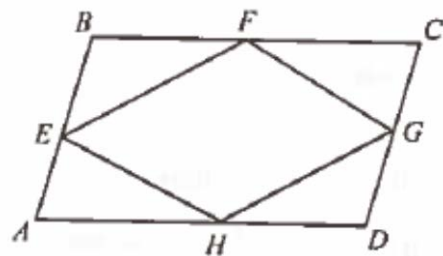
**Prove:** LMNO is a kite



3. Write a two-column or a flowchart proof.

**Given:**  $\triangle EBF \cong \triangle GDH$ ;  $\triangle AEH \cong \triangle CGF$

**Prove:** EFGH is a parallelogram



4. True or False.

- (a) Two consecutive angles of a parallelogram are always supplementary.  
 (b) If two consecutive sides of a parallelogram are congruent, then the parallelogram must be a rhombus.

4. (c) Every square is a rhombus.  
 (d) The diagonals of a rectangle are congruent.  
 (e) A rectangle is always a square.

5. Solve.

**Given:** Rectangle  $ABCD$  with  $AD = 6x - 1$ ;  
 $AB = 2x + 3$ ;  $BC = 5x + 2$

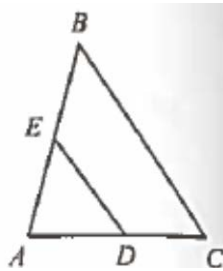
**Find:**  $x$  and  $CD$



6. Solve.

**Given:**  $\triangle ABC$  with midpoints  $E$   
 and  $D$  of the respective  
 sides and  $DE = 9x - 4$ ;  
 $BC = 6x + 4$

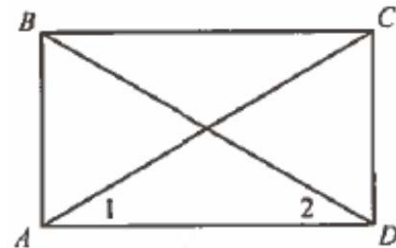
**Find:**  $x$ ,  $DE$ , and  $BC$



7. Write a two-column or a flowchart proof.

**Given:** Rectangle  $ABCD$  and diagonals  $AC$  and  $\overline{BD}$

**Prove:**  $\angle 1 \cong \angle 2$



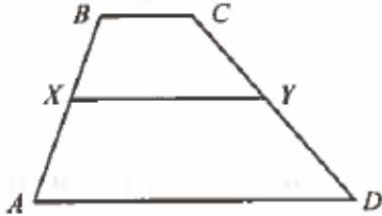
8. Construct a square with diagonals measuring 2 inches.

9. True or False.

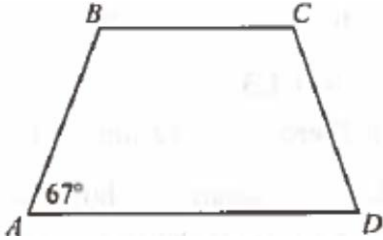
(a) The diagonals of a trapezoid bisect each other.

(b) Opposite angles of an isosceles trapezoid are supplementary.

10. Given: Trapezoid ABCD, where  $\overline{BC} \parallel \overline{AD}$  and X and Y are midpoints of the legs. If  $XY = 12.6$  and  $BC = 3$ , find AD.



11. Given: Isosceles trapezoid ABCD, where  $\overline{BC} \parallel \overline{AD}$  and  $m\angle A = 67^\circ$ . Find the measures of the other angles.



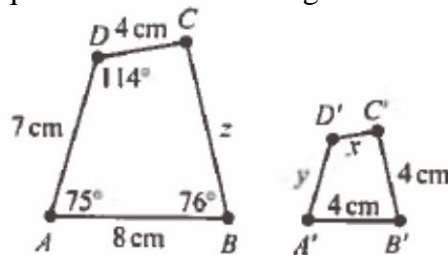
12. Write each ratio as a fraction, and simplify.

(a) 300 mi in 5 hr

(b) 32 hits in 100 at bats

13. If  $\frac{1}{4}$  inch on a map represents 20 miles, how many miles are represented by  $2\frac{1}{2}$  inches?

14. Refer to the quadrilaterals in the diagram. Assume that  $ABCD \sim A'B'C'D'$ .



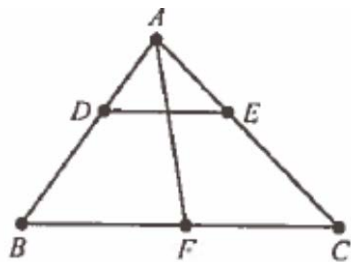
(a) Find the value of y.

(b) Find the value of x.

(c) Find the value of z.

(d) Find  $m\angle C$ .

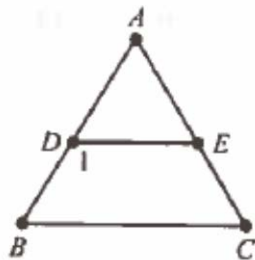
15. Refer to the figure below in which  $\overline{DE} \parallel \overline{BC}$  and  $\overline{AF}$  bisects  $\angle A$ .



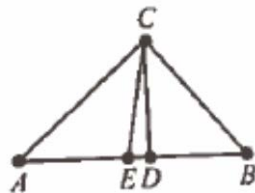
- (a) If  $AD = 20$  ft,  $DB = 15$  ft, and  $AE = 28$  ft, find  $EC$ .
- (b) If  $AB = 30$  m,  $AC = 80$  m, and  $BC = 77$  m, find  $BF$  and  $FC$ .
16. Write a two-column or a flowchart proof.

**Given:**  $\triangle ABC$  is isosceles with base  $\overline{BC}$ , and  $\angle C$  is supplementary to  $\angle 1$

**Prove:**  $\frac{AD}{DB} = \frac{AE}{EC}$

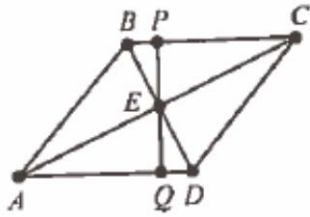


17. Refer to the figure in which  $E$  is the midpoint of  $\overline{AB}$ ,  $\overline{CD} \perp \overline{AB}$ , and  $\angle C$  is a right angle in  $\triangle ABC$ .



- (a) If  $AB = 44$  cm, find  $CE$ .
- (b) If  $AD = 36$  ft and  $DB = 25$  ft, find the area of  $\triangle ABC$ .

18. Refer to the figure in which ABCD is a rhombus with diagonals  $\overline{AC}$  and  $\overline{BD}$ .



Given:  $\overline{PQ} \perp BC$

Prove:  $(PE)^2 = (BP)(PC)$

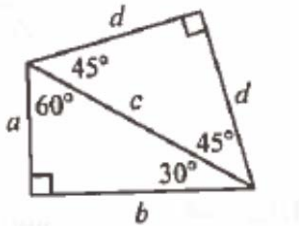
19. A pasture is in the shape of a right triangle with hypotenuse 100 yd and one leg 80 yd. What is the area of the pasture?

Use the Pythagorean Theorem to find the length of the missing side in right triangle  $\Delta ABC$  with right angle C.

20.  $a = 11$  cm,  $b = 8$  cm,  $c = \underline{\hspace{2cm}}$

21.  $a = 50$  ft,  $c = 75$  ft,  $b = \underline{\hspace{2cm}}$

Refer to the figure.



22. If  $b = 7$  ft, find  $c$ .

23. If  $d = 5\sqrt{2}$  cm, find  $c$ .

24. A mountain road is inclined  $30^\circ$  with the horizontal. If a pickup truck drives 2 miles on this road, what change in altitude has been achieved?