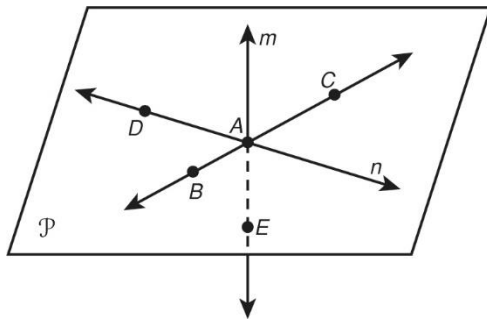


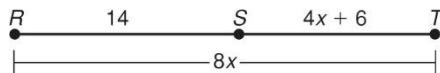
Chapter 1

Use the figure for Exercises 1–4.



- What is another name for plane P ?  
 A plane AE      C plane BAD  
 B plane A      D plane BAC
- Which segment is on line n?  
 F  $\overline{AD}$       H  $\overline{AC}$   
 G  $\overline{BC}$       J  $\overline{BE}$
- Which is the name of a ray with endpoint A?  
 A  $\overline{DA}$       C  $\overline{CA}$   
 B  $\overline{BC}$       D  $\overline{AB}$
- Name the intersection of plane P and line m.  
 F line n      H AC  
 G point A      J  $\overline{AE}$

5. What is the measure of  $\overline{RT}$  ?

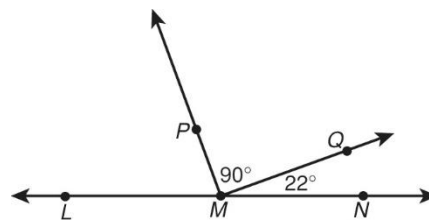


- A 5      C 26  
 B 16      D 40

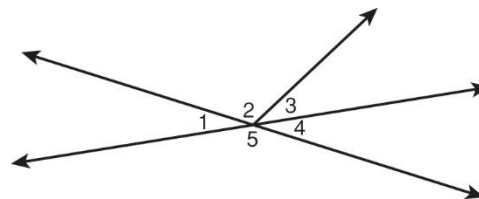
6. Given  $LM = MP$  and L, M, and P are collinear, which of the following BEST describes the relationship of L, M, and P?

- F  $\overline{LM} \cong \overline{MP}$   
 G M is the midpoint of  $\overline{LP}$ .  
 H M bisects  $\overline{LP}$ .  
 J All of the above

Use the figure for Exercises 7 and 8.



- Which term describes  $\angle PMQ$ ?  
 A obtuse      C right  
 B straight      D acute
- What is  $m\angle PMN$ ?  
 F  $22^\circ$       H  $68^\circ$   
 G  $90^\circ$       J  $112^\circ$
- Which angles are adjacent and form a linear pair?



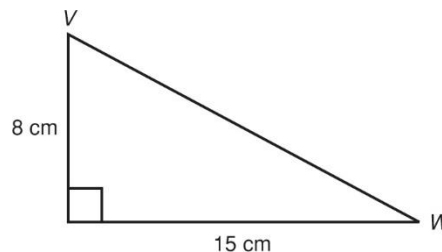
- A  $\angle 1$  and  $\angle 2$       C  $\angle 2$  and  $\angle 3$   
 B  $\angle 3$  and  $\angle 4$       D  $\angle 1$  and  $\angle 5$

10. If  $m\angle A = (4x + 2)^\circ$ , what is the measure of the complement of  $\angle A$ ?

- F  $90^\circ$       H  $(178 - 4x)^\circ$   
 G  $(4x + 92)^\circ$       J  $(88 - 4x)^\circ$

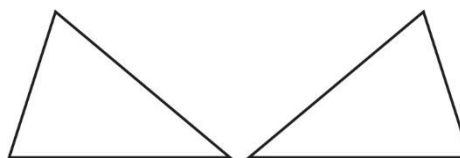
11. If  $m\angle B = (3x - 16)^\circ$ , what is the measure of the supplement of  $\angle B$ ?
- A  $180^\circ$                       C  $(164 - 3x)^\circ$   
 B  $(196 - 3x)^\circ$             D  $(16 - 3x)^\circ$
12. What is the perimeter of a square whose side is 8.2 centimeters?
- F 16.4 cm                      H  $32.8 \text{ cm}^2$   
 G 32.8 cm                      J  $67.24 \text{ cm}^2$
13. What is the area of a triangle with a height of 3 inches and a base of 5.5 inches?
- A  $8.25 \text{ in}^2$                       C 16.5 in.  
 B  $8.5 \text{ in}^2$                       D  $16.5 \text{ in}^2$
14. A circle has a diameter of 8 feet. What is its approximate area?
- F  $12.56 \text{ ft}^2$                       H  $50.24 \text{ ft}^2$   
 G  $25.12 \text{ ft}^2$                       J  $200.96 \text{ ft}^2$
15. Given  $\overline{GH}$  with endpoints  $G(-11, 4)$  and  $H(-1, -9)$ , what are the coordinates of the midpoint of  $\overline{GH}$ ?
- A  $(-12, -5)$                       C  $(-10, 13)$   
 B  $(-6, -2.5)$                       D  $(-5, 6.5)$
16.  $M$  is the midpoint of  $\overline{RS}$ .  $R$  has coordinates  $(-12, 4)$ , and  $M$  has coordinates  $(1, -2)$ . What are the coordinates of  $S$ ?
- F  $(-5.5, -1)$                       H  $(13, 6)$   
 G  $(-11, 2)$                       J  $(14, -8)$
17. What is the distance from  $M(-1, 6)$  to  $N(11, 1)$ ?
- A 12 units                      C 13 units  
 B  $\sqrt{149}$  units                      D 169 units

18. What is the distance from  $V$  to  $W$ ?



- F 17 cm                      H 120 cm  
 G 23 cm                      J 289 cm

19. What transformation is shown?



- A rotation                      C translation  
 B reflection                      D image

20. Given a point in the coordinate plane, the rule  $(x, y) \rightarrow (x + 2, y - 3)$  translates the point in which direction?
- F 2 units to the left and 3 units up  
 G 3 units to the left and 2 units down  
 H 3 units right and 2 units up  
 J 2 units to the right and 3 units down

Chapter 2

1. What is the next item in the pattern?

-1, 2, -4, 8, . . .

- A -16                      C 4  
B -4                         D 16

2. Which is a counterexample that shows that the following conjecture is false: "If  $\angle 1$  and  $\angle 2$  are supplementary, then one of the angles is obtuse"?

- F  $m\angle 1 = 45^\circ$  and  $m\angle 2 = 45^\circ$   
G  $m\angle 1 = 53^\circ$  and  $m\angle 2 = 127^\circ$   
H  $m\angle 1 = 90^\circ$  and  $m\angle 2 = 90^\circ$   
J  $m\angle 1 = 100^\circ$  and  $m\angle 2 = 80^\circ$

3. removed

4. Given the conditional statement "If it is January, then it is winter in the United States," which is true?

- F the converse of the conditional  
G the inverse of the conditional  
H the contrapositive of the conditional  
J Not here

5. What is the inverse of the conditional statement "If a number is divisible by 6, then it is divisible by 3"?

- A If a number is divisible by 3, then it is divisible by 6.  
B If a number is not divisible by 6, then it is not divisible by 3.  
C If a number is not divisible by 3, then it is not divisible by 6.  
D If a number is not divisible by 6, then it is divisible by 3.

6. removed

7. removed

8. Which is a biconditional statement of the conditional statement "If  $x^3 = -1$ , then  $x = -1$ "?

- F If  $x = -1$ , then  $x^3 = -1$ .  
G  $x^3 = -1$  if  $x = -1$ .  
H  $x^3 = -1$  if and only if  $x = -1$ .  
J  $x = -1 \rightarrow x^3 = -1$ .

9. Which property is NOT used when solving  $15 = 2x - 1$ ?

- A Reflex. Prop. of =  
B Add. Prop. of =  
C Div. Prop. of =  
D Sym. Prop. of =

10. Identify the property that justifies the statement "If  $\angle B \cong \angle A$ , then  $\angle A \cong \angle B$ ."

- F Sym. Prop. of =  
G Reflex. Prop. of =  
H Trans. Prop. of =  
J Sym. Prop. of  $\cong$

Use the partially completed two-column proof for Exercises 11 and 12.

**Given:**  $m\angle 1 = 30^\circ$  and  $m\angle 2 = 2m\angle 1$ .

**Prove:**  $\angle 1$  and  $\angle 2$  are complementary.

**Proof:**

Statements	Reasons
1. $m\angle 1 = 30^\circ$ , $m\angle 2 = 2m\angle 1$	1. Given
2. <u>    ?</u>	2. <u>    ?</u>
3. <u>    ?</u>	3. <u>    ?</u>
4. <u>    ?</u>	4. <u>    ?</u>
5. <u>    ?</u>	5. Simplify.
6. $\angle 1$ and $\angle 2$ are complementary.	6. Def. of comp. $\sphericalangle$

11. Each of the items listed below belongs in one of the blanks in the Statements column. Which belongs in Step 4?

- A  $m\angle 2 = 2(30^\circ)$
- B  $m\angle 1 + m\angle 2 = 90^\circ$
- C  $m\angle 1 + m\angle 2 = 30^\circ + 60^\circ$
- D  $m\angle 2 = 60^\circ$

12. Which is the justification for Step 2?

- F Add. Prop. of =
- G Simplify.
- H Subst.
- J  $\angle$  Add. Post.

Use the partially completed two-column and flowchart proofs for Exercises 13 and 14.

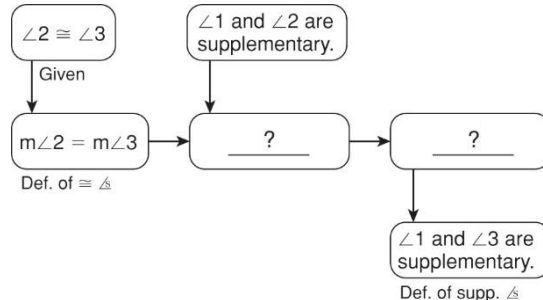
**Given:**  $\angle 2 \cong \angle 3$ , and  $\angle 1$  and  $\angle 2$  are adjacent angles whose noncommon sides form a straight line.

**Prove:**  $\angle 1$  and  $\angle 3$  are supplementary.

**Two-Column Proof:**

Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. Given
2. $m\angle 2 = m\angle 3$	2. Def. of $\cong \sphericalangle$
3. $\angle 1$ and $\angle 2$ are supplementary.	3. <u>    ?</u>
4. $m\angle 1 + m\angle 2 = 180^\circ$	4. Def. of supp. $\sphericalangle$
5. $m\angle 1 + m\angle 3 = 180^\circ$	5. <u>    ?</u>
6. $\angle 1$ and $\angle 3$ are supplementary.	6. Def. of supp. $\sphericalangle$

**Flowchart Proof:**



13. In the flowchart proof, which belongs in the last blank box?

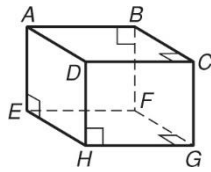
- A  $m\angle 1 + m\angle 2 = 180^\circ$
- B Def. of supp.  $\sphericalangle$
- C  $m\angle 1 + m\angle 3 = 180^\circ$
- D Subst.

14. In the flowchart proof, which theorem justifies the statement " $\angle 1$  and  $\angle 2$  are supplementary"?

- F Linear Pair Theorem
- G Congruent Supplements Theorem
- H Right Angle Congruence Theorem
- J Congruent Complements Theorem

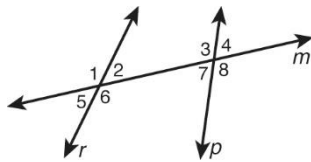
Chapter 3

Use the figure for Exercises 1 and 2.



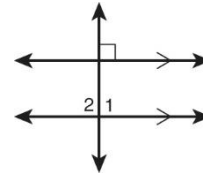
- Classify  $\overline{EH}$  and  $\overline{DH}$ .  
 A skew segments  
 B parallel segments  
 C perpendicular segments  
 D parallel planes
- How many segments are skew to  $\overline{AE}$ ?  
 F 1                      H 3  
 G 2                      J 4

Use the figure for Exercises 3 and 4.



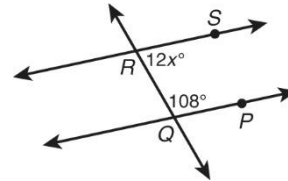
- Which are alternate exterior angles?  
 A  $\angle 1$  and  $\angle 3$       C  $\angle 3$  and  $\angle 6$   
 B  $\angle 1$  and  $\angle 8$       D  $\angle 6$  and  $\angle 7$
- Which statement is true?  
 F  $\angle 1$  and  $\angle 2$  are alternate interior angles.  
 G  $\angle 1$  and  $\angle 3$  are corresponding angles.  
 H  $\angle 3$  and  $\angle 6$  are alternate exterior angles.  
 J  $\angle 3$  and  $\angle 7$  are same-side interior angles.
- Which correctly completes the sentence?  
 If two parallel lines are cut by a transversal, then the two pairs of same-side interior angles are \_\_\_\_\_.  
 A supplementary  
 B complementary  
 C corresponding  
 D congruent

- What type of angle is  $\angle 1$ ?



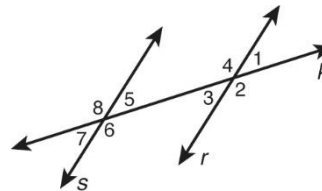
- F acute                      H obtuse  
 G right                      J straight

- Given  $\overline{RS} \parallel \overline{QP}$ , what is the value of  $x$ ?



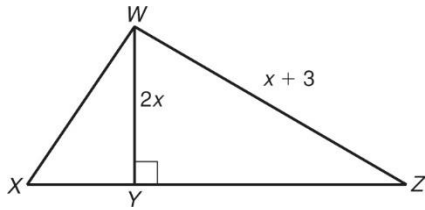
- A 6                      C 72  
 B 9                      D 108

Use the figure for Exercises 8 and 9.



- Which information proves that  $r \parallel s$ ?  
 F  $\angle 1 \cong \angle 3$                       H  $\angle 4 \cong \angle 6$   
 G  $\angle 4 \cong \angle 5$                       J  $\angle 5 \cong \angle 6$
- If  $m\angle 3 = (4x + 20)^\circ$  and  $m\angle 5 = (6x + 10)^\circ$ , what value of  $x$  proves that  $r \parallel s$ ?  
 A 5                      C 40  
 B 15                      D 100
- If a transversal is perpendicular to one of two parallel lines, how many different angle measures are formed?  
 F 1                      H 4  
 G 3                      J 8

11. Which is a possible value of  $x$ ?

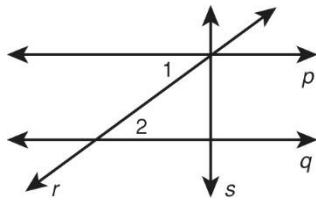


- A -2                      C 3  
 B 1                        D 4

12. Given:  $\overline{AB} \parallel \overline{CD}$ .  $E$  is on  $\overline{AB}$ , and  $F$  is on  $\overline{CD}$ .  $\overline{EF}$  is the perpendicular bisector of  $\overline{CD}$ . What is the shortest segment from  $E$  to  $\overline{CD}$ ?

- F  $\overline{AF}$                       H  $\overline{EF}$   
 G  $\overline{EC}$                      J  $\overline{EC}$

13. Which justifies Step 3?



**Given:**  $s \perp q$  and  $\angle 1 \cong \angle 2$ .

**Prove:**  $s \perp p$

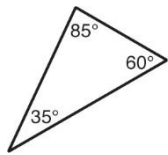
**Proof:**

Statements	Reasons
1. $\angle 1 \cong \angle 2, s \perp q$	1. Given
2. $p \parallel q$	2. <u>  ?  </u>
3. $s \perp p$	3. <u>  ?  </u>

- A  $\perp$  Transv. Thm.  
 B  $p \parallel r$   
 C Conv. of Alt. Int.  $\perp$  Thm.  
 D 2 lines  $\perp$  to same line  $\rightarrow$  2 lines  $\parallel$

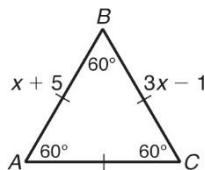
Chapter 4

1. Classify the triangle.



- A isosceles acute
- B isosceles obtuse
- C scalene acute
- D scalene obtuse

Use the figure for Exercises 2 and 3.



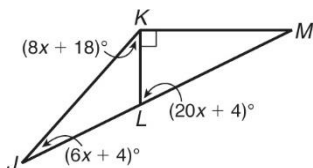
2. Which is NOT a correct classification for the triangle?

- F acute
- H isosceles
- G equiangular
- J scalene

3. What is the length of side  $\overline{BC}$ ?

- A 3
- C 10
- B 8
- D 24

Use the figure for Exercises 4 and 5.



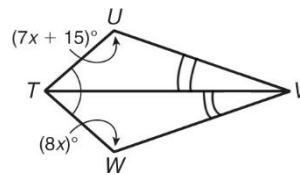
4. What is  $m\angle KLM$ ?

- F 3
- H 42
- G 22
- J 64

5. What is  $m\angle M$ ?

- A 0.2
- C 26
- B 4
- D 64

6. What is the  $m\angle U$ ?



- F 5
- H 40
- G 15
- J 120

7. Two congruent triangles have the following corresponding parts:

$$\overline{RS} \cong \overline{UV}, \overline{RT} \cong \overline{UW}, \text{ and } \angle R \cong \angle U.$$

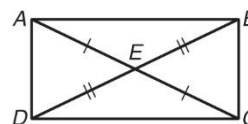
Which is NOT necessarily a correct congruence statement?

- A  $\triangle RST \cong \triangle UVW$
- B  $\triangle STR \cong \triangle VWU$
- C  $\triangle TRS \cong \triangle VWU$
- D  $\triangle TRS \cong \triangle WUV$

8.  $\triangle KLM \cong \triangle RST$ .  $m\angle L = (3x + 15)^\circ$  and  $m\angle S = (6x + 3)^\circ$ . What is the value of  $x$ ?

- F 2
- H 6
- G 4
- J 27

Use the figure for Exercises 9–12.



9. If  $AD = 5y + 7$  and  $BC = 7y - 3$ , what must the value of  $y$  be to prove  $\triangle AED \cong \triangle CEB$  by the SSS Postulate?

- A 2
- C 17
- B 5
- D 32

10. What postulate or theorem justifies the congruence statement  $\triangle ABE \cong \triangle CDE$ ?

- F SSS
- H ASA
- G SAS
- J AAS

11. If  $\angle B$  and  $\angle C$  are right angles, what additional congruence statement would allow you to prove  $\triangle DCB \cong \triangle ABC$  by the ASA postulate?

- A  $\angle DBC \cong \angle ACB$
- B  $\angle BDC \cong \angle CAB$
- C  $\overline{AB} \cong \overline{DC}$
- D  $\overline{AC} \cong \overline{DB}$

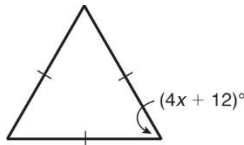
12. If  $\angle A$  and  $\angle C$  are right angles and  $\overline{AD} \cong \overline{BC}$ , what postulate or theorem justifies the congruence statement  $\triangle BCD \cong \triangle DAB$ ?

- F SAS                      H AAS
- G ASA                      J HL

13. removed

14. removed

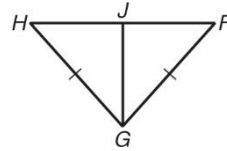
15. What is the value of  $x$ ?



- A 12                      C 18
- B 19.5                      D 60

**Use the partially completed two-column proof for Exercises 16–18.**

**Given:**  $\overline{GJ}$  bisects  $\angle FGH$ ,  $\overline{FG} \cong \overline{HG}$



**Prove:**  $\overline{FJ} \cong \overline{HJ}$

**Proof:**

Statements	Reasons
1. $\overline{GJ}$ bisects $\angle FGH$ .	1. Given
2. $\angle FGJ \cong \angle HGJ$	2. Def. of $\angle$ bisector
3. $\overline{FG} \cong \overline{HG}$	3. Given
4. $\angle F \cong \angle H$	4. _____ ? _____
5. $\triangle FGJ \cong \triangle HGJ$	5. _____ ? _____
6. $\overline{FJ} \cong \overline{HJ}$	6. _____ ? _____

16. Which reason belongs in Step 4?

- F Isosc.  $\triangle$  Thm.
- G Conv. of Isosc.  $\triangle$  Thm.
- H ASA
- J Def. of  $\angle$  bisector

17. Which reason belongs in Step 5?

- A Isosc.  $\triangle$  Thm.    C CPCTC
- B ASA                      D HL

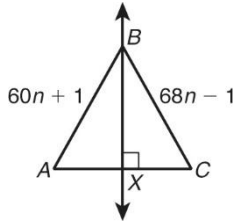
18. Which reason belongs in Step 6?

- F Isosc.  $\triangle$  Thm.
- G ASA
- H CPCTC
- J Def. of  $\angle$  bisector

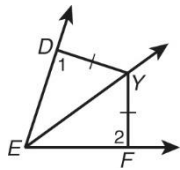


Chapter 5

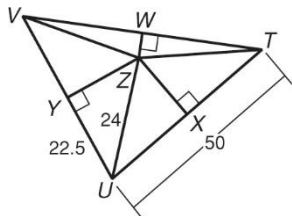
1.  $\overline{BX}$  is the perpendicular bisector of  $\overline{AC}$ .  
What is the value of  $n$ ?



- A 0                                      C 4  
B  $\frac{1}{4}$                                       D Not here
2. Which point is on the perpendicular bisector of the segment with endpoints  $(-2, 5)$  and  $(-2, -3)$ ?
- F  $(-2, 8)$                               H  $(-2, 1)$   
G  $(-2, 4)$                               J  $(1, -2)$
3. What information is sufficient to allow you to conclude that  $Y$  is on the bisector of  $\angle E$ ?

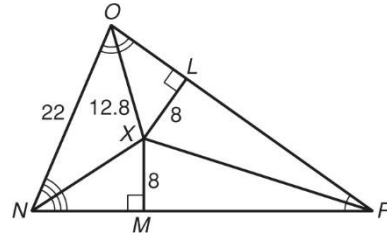


- A  $m\angle 1 = 90^\circ$   
B  $m\angle 2 = 90^\circ$   
C  $m\angle 1 = 90^\circ$  and  $m\angle 2 = 90^\circ$   
D  $m\angle FYE + m\angle DYE = 90^\circ$
4. Point  $Z$  is the circumcenter of  $\triangle TUV$ .  
What is the value of  $UV$ ?



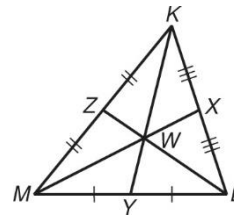
- F 33.75                                      H 50  
G 45    J Not here

5. What is the distance from  $X$  to  $\overline{ON}$ ?



- A 8    C 11  
B 12.8                                        D 12

6. If  $WX = 3.6$ ,  $WL = 6.1$ , and  $KW = 8$ , what is the value of  $ZW$ ?

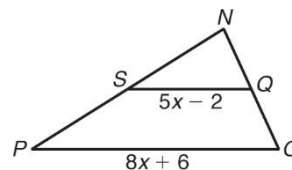


- F 3.05                                        H 4  
G 3.6                                        J 4.06

7. Which is the orthocenter of a triangle with vertices  $(-2, 1)$ ,  $(3, 4)$ , and  $(3, -4)$ ?

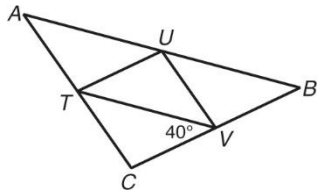
- A  $(0, 1)$                                       C  $(6, 1)$   
B  $(1, 0)$                                       D  $(8, 1)$

8.  $\overline{SQ}$  is a midsegment of  $\triangle NOP$ . What is the length of  $\overline{OP}$ ?



- F 5    H 23  
G 14    J 46

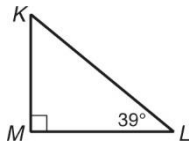
9.  $\triangle TUV$  is the midsegment triangle of  $\triangle ABC$ . Which angle does NOT necessarily measure  $40^\circ$ ?



- A  $\angle VTU$                       C  $\angle CTU$   
 B  $\angle TUA$                       D  $\angle VBU$

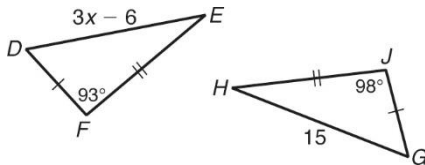
10. removed  
 11. The lengths of two sides of a triangle are 7 and 11. Which could NOT be the length of the third side?  
 A 5                                  C 12  
 B 10                                 D 19

12. Which statement is false?



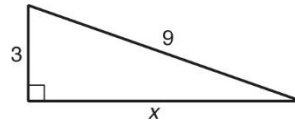
- F  $\triangle KLM$  is scalene.  
 G  $ML + KM > KL$   
 H  $m\angle L < m\angle K$   
 J  $KM > ML$

13. Which best describes the range of values for  $x$ ?



- A  $0 < x < 7$                       C  $x < 15$   
 B  $0 < x < 15$                       D  $6 < x < 7$

14. What is the value of  $x$  in simplest radical form?



- F  $3\sqrt{12}$                       H  $\sqrt{72}$   
 G  $6\sqrt{2}$                       J  $\sqrt{89}$

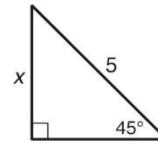
15. Which numbers form a Pythagorean triple?

- A 3, 4, 6                          C 9, 12, 15  
 B 7,  $6\sqrt{2}$ , 11                  D 8, 15, 18

16. Which side length will form an obtuse triangle with sides of length 8 and 10?

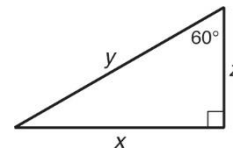
- F 6                                  H 12  
 G 9                                  J 13

17. What is the value of  $x$  in simplest radical form?



- A 2.5                                 C  $\frac{5\sqrt{2}}{2}$   
 B  $\frac{5}{\sqrt{2}}$                               D  $5\sqrt{2}$

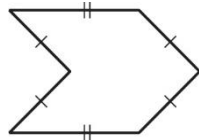
18. Which is a correct set of values?



- F  $x = 27$ ,  $y = 9\sqrt{3}$ ,  $z = 18\sqrt{3}$   
 G  $x = 27$ ,  $y = 18\sqrt{3}$ ,  $z = 9\sqrt{3}$   
 H  $x = 9\sqrt{3}$ ,  $y = 27$ ,  $z = 18\sqrt{3}$   
 J  $x = 18\sqrt{3}$ ,  $y = 9\sqrt{3}$ ,  $z = 27$

Chapter 6

1. Which term does NOT describe the figure?

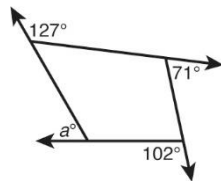


- A concave                      C polygon  
B hexagon                      D regular

2. What is the sum of the measures of the interior angles of a 5-sided convex polygon?

- A 72                              C 540  
B 360                          D 900

3. What is the value of  $a$ ?

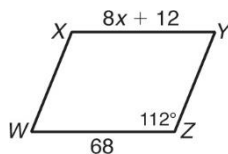


- A 60  
B 80

4. The diagonals of  $\square ABCD$  intersect at  $X$ . Which is NOT true?

- A  $\angle DAB \cong \angle BCD$   
B  $m\angle DAB + m\angle CBA = 180^\circ$   
C  $\overline{BC} \cong \overline{AD}$   
D  $\overline{AX} \cong \overline{XB}$

Use the figure for Exercises 5 and 6.



5.  $WXYZ$  is a parallelogram. Which is  $m\angle W$ ?

- A  $68^\circ$   
B  $112^\circ$

6.  $WXYZ$  is a parallelogram. What is the value of  $x$ ?

- A 7  
B 10

7. Which MUST be a parallelogram?

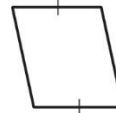


Figure 1

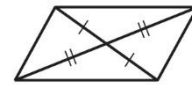
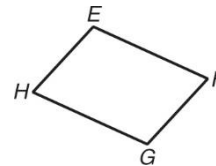


Figure 2

- A Figure 1  
B Figure 2

8. If  $\overline{EF} \parallel \overline{GH}$ , what additional information would allow you to conclude that  $EFGH$  is a parallelogram?

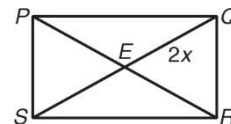


- A  $\overline{EF} \cong \overline{GH}$   
B  $\overline{FG} \cong \overline{EH}$

9. Which is NOT always true?

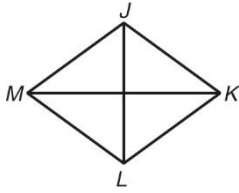
- A A square is a rhombus.  
B A rectangle is a parallelogram.  
C A rhombus is a rectangle.  
D A square is a rectangle.

10.  $PQRS$  is a rectangle.  $PR = 26$ . What is the value of  $x$ ?



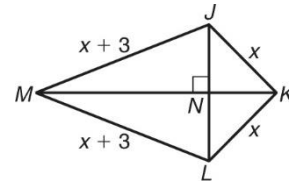
- A 6.5  
B 13

11.  $JKLM$  is a rhombus. If  $m\angle JML = 70^\circ$ , what is the value of  $m\angle JKM$ ?

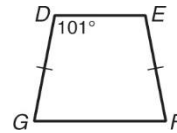


- A  $35^\circ$   
 B  $55^\circ$   
 C  $70^\circ$   
 D  $110^\circ$
12. removed  
 13. removed

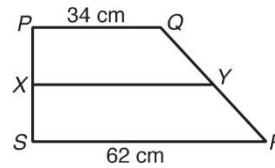
14. Which best describes the figure?



- A kite  
 B parallelogram  
 C quadrilateral  
 D trapezoid
15. What is  $m\angle F$  in the isosceles trapezoid?



- A  $79^\circ$   
 B  $101^\circ$
16. In trapezoid  $PQRS$ , what is the length of midsegment  $\overline{XY}$ ?



- A 48 cm  
 B 51 cm