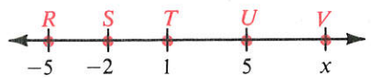
4. Congruent segments have equal lengths. Congruent angles have equal measures.
5. Angles are classified as acute, right, obtuse, or straight, according to their measures.
6. Properties of equality and congruence (p. 17) are used to reach conclusions about segments and their lengths and about angles and their measures.
7. Statements that are accepted without proof are called postulates. You should understand the Ruler Postulate, the Segment Addition Postulate, the Protractor Postulate, and the Angle Addition Postulate.
8. Statements that are proved are called theorems.
9. Deductive reasoning is a process of logical reasoning from accepted statements (given information, definitions, postulates, and previously proved theorems) to a conclusion.
10. Perpendicular lines are two lines that form right angles.
11. Two angles are congruent if they are:
    a. vertical angles
    b. adjacent angles formed by perpendicular lines
    c. supplements of congruent angles or of the same angle
    d. complements of congruent angles or of the same angle

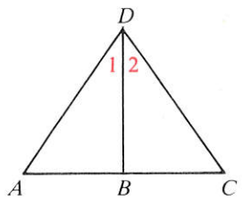
Chapter Review

Sketch and label the figures described.

1. Points A, B, C, and D are coplanar, but A, B, and C are the only three of those points that are collinear. 1-1
2. Line l intersects plane X in point P.
3. Plane M contains intersecting lines j and k.
4. Name a point on $\overrightarrow{ST}$ that is not on $\overline{ST}$. 1-2
5. a. Find RS and ST.



   b. Complete: $\overline{RS}$ and $\overline{ST}$ are ___?___.
6. If U is the midpoint of $\overline{TV}$, find the value of x.
7. Name three angles that have vertex D. Which angles with vertex D are adjacent angles? 1-3
8. a. If $m\angle ABD = 88$, then $m\angle CBD =$ ___?___.



   b. Name the postulate that justifies your answer in part (a).
   c. What kind of angle is $\angle CBD$?
9. $\overrightarrow{DB}$ bisects $\angle ADC$, $m\angle 1 = 5x - 3$, and $m\angle 2 = x + 25$. Find the value of x.

Justify each statement with a property from algebra or a property of congruence.

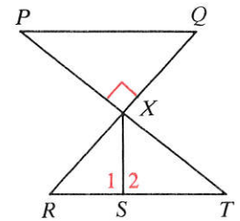
10. If $\angle A \cong \angle B$ and $\angle B \cong \angle C$, then $\angle A \cong \angle C$. 1-4
11. If $RS = XY$ and $ST = YZ$, then $RS + ST = XY + YZ$.
12. If $m\angle 1 + m\angle 2 = m\angle 3$ and $m\angle 2 = m\angle 4$, then $m\angle 1 + m\angle 4 = m\angle 3$.

Refer to the diagram for Exercises 7–9. Name the postulate, definition, or theorem that justifies the statement.

13. If B is the midpoint of $\overline{AC}$, then $AB = \frac{1}{2}AC$. 1-5
14. If $m\angle 1 = m\angle 2$, then $\overrightarrow{DB}$ bisects $\angle ADC$.
15. If $\overrightarrow{DB}$ is the bisector of $\angle ADC$, then $2m\angle 2 = m\angle ADC$.
16. Two vertical angles are complementary. Find the measure of each angle. 1-6

Exercises 17 and 18 refer to the diagram.

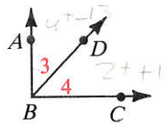
17. Find the measure of $\angle RXT$. State the theorem that justifies your answer.
18. Name two pairs of supplementary angles.



Exs. 17–20

State the definition or theorem that justifies the statement about the diagram at the right.

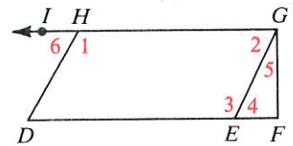
19. If $\overline{XS} \perp \overline{RT}$, then $\angle 1 \cong \angle 2$. 1-7
20. If $\angle 1 \cong \angle 2$, then $\overline{XS} \perp \overline{RT}$.
21. Given: $\overrightarrow{BA} \perp \overrightarrow{BC}$;
    $m\angle 3 = 4t - 13$;
    $m\angle 4 = 2t + 19$
    Find the value of t.



Ex. 21

What can you deduce from the given information?

22. Given: $\angle 2$ and $\angle 5$ are complements. 1-8
23. Given: $\overline{FG} \perp \overline{GH}$;
    $\angle 4$ and $\angle 5$ are comp. $\measuredangle$s.
24. Given: $\angle 1 \cong \angle 3$

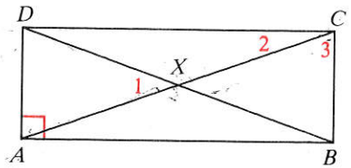


Classify each statement as true or false.

25. Through any three points there is exactly one plane. 1-9
26. Two intersecting lines may be noncoplanar.
27. Through any three points there is at least one line.
28. If points A and B lie in plane P, then so does the midpoint, M, of $\overline{AB}$.

Chapter Test

1. Name three collinear points.
2. Name the intersection of $\overleftrightarrow{CX}$ and $\overleftrightarrow{AB}$.
3. Which postulate justifies the statement $AX + XC = AC$?
4. If $\overline{AC}$ bisects $\overline{BD}$, name two congruent segments.
5. Name the vertex and sides of $\angle 1$.
6. Name a right angle.
7. Name two adjacent supplementary angles.
8. Name two complementary angles.
9. Name the property that justifies the following statement:
   If $\overline{AX} \cong \overline{XC}$ and $\overline{XC} \cong \overline{XD}$, then $\overline{AX} \cong \overline{XD}$.
10. Complete: If X is the midpoint of $\overline{AC}$, then $AX = \frac{1}{2}$ ___?___.
11. If $m\angle 1 = 46$, find $m\angle DXC$ and $m\angle CXB$.
12. If $m\angle DAX = 70$, find the measure of $\angle XAB$.



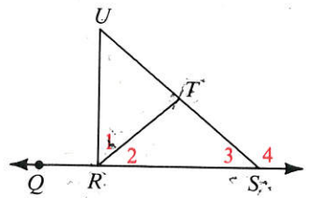
Exs. 1–12

13. On a number line, J has coordinate -7 and K has coordinate -2. K is the midpoint of $\overline{JL}$. Find the coordinate of L.

Complete with *always*, *sometimes*, or *never*.

14. If two planes intersect, then their intersection is ___?___ a segment.
15. A line and a point not on the line are ___?___ coplanar.

16. If $\overrightarrow{RT}$ bisects $\angle URS$, $m\angle 1 = 6x - 30$, and $m\angle URS = 5x + 24$, find the value of x.
17. Justify each statement.
    a. $m\angle 1 + m\angle 2 = m\angle URS$
    b. If $RT = ST$, then $\frac{1}{3}RT = \frac{1}{3}ST$.
    c. If $\overleftrightarrow{RU} \perp \overleftrightarrow{QS}$, then $\angle URQ \cong \angle URS$.
18. Write a two-column proof.
    Given: $\angle 2$ and $\angle 4$ are supp. $\measuredangle$.
    Prove: $\angle 2 \cong \angle 3$



Exs. 16–18

Algebra Review

Solve each equation.

1. $5a - 22 = 8$
2. $2z = 5z + 12$
3. $3x - 4 = 2x + 4$
4. $3(9 - t) = 5 + t$
5. $4(90 - x) = 180 - x$
6. $90 - y = 3 + 2y$
7. $(n - 2)180 = 160n$
8. $b(b - 3) = b^2 + 12$
9. $2k(k - 1) = k(2k + 1)$
10. $5(2d + 1) = 3(5d - 5)$
11. $5 + 1.6m = 1$
12. $0.3q - 8 = 6 + q$

Solve each system of equations.

Example 1 (1) $x - 3y = 6$
(2) $4x + 5y = 7$

Solution 1 Substitution method

From (1): $x = 3y + 6$
Substituting $3y + 6$ for x in (2):
$4(3y + 6) + 5y = 7$
$17y + 24 = 7$; $y = -1$
Substituting -1 for y in (1):
$x - 3(-1) = 6$; $x = 3$

Solution 2 Addition-or-subtraction method

$4 \times$ (1): $4(x - 3y) = 4(6)$
$4x - 12y = 24$
(2) $4x + 5y = 7$
Subtract: $-17y = 17$; $y = -1$
Substituting -1 for y in (1):
$x - 3(-1) = 6$; $x = 3$

Both methods lead to $x = 3$, $y = -1$.

13. $2x - 3y = -2$
    $5x + 3y = 37$
14. $-4x + 7y = 2$
    $4x - 5y = 10$
15. $2x - 5y = 0$
    $x - 5y = 10$
16. $y = 5x - 3$
    $8x - y = 9$
17. $y = x - 8$
    $x - 4y = 5$
18. $4x + 3y = -9$
    $2x - y = 3$
19. $5x + y = 29$
    $2x - 3y = 32$
20. $x + 4y = 7$
    $2x - y = -1$
21. $2x - 3y = 21$
    $8x + 5y = -1$
22. $8x - 9y = 14$
    $5x + 3y = 26$
23. $7x + 4y = 2$
    $3x - 8y = 13$
24. $12x - 7y = -6$
    $4x - 9y = -2$

Example 2 $7x - 6y = 4$ $\times 2 \Rightarrow$ $14x - 12y = 8$
$3x + 4y = -18$ $\times 3 \Rightarrow$ $9x + 12y = -54$
Add: $23x = -46$; $x = -2$
Substitute: $7(-2) - 6y = 4$; $-6y = 18$; $y = -3$
The solution is $x = -2$, $y = -3$.

25. $4x - 5y = 0$
    $3x + 2y = -46$
26. $3x + 7y = 1$
    $4x + 11y = 8$
27. $13x + 11y = -1$
    $2x - 3y = 28$
28. $4x + 5y = -9$
    $5x - 2y = 8$
29. $2x = 7(1 - y)$
    $3x + 8y = -2$
30. $3(2x - 5) = y$
    $5x - y = 11$