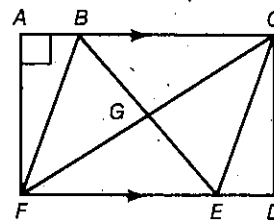


Practice 13

Cumulative Practice, Chapters 1-3

In Exercises 1-14, refer to the diagram. Complete.



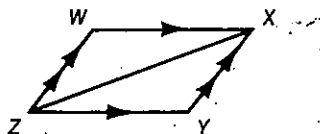
Exs. 1-14

1. $m\angle AFE =$ _____
2. If $BG = x + 4$, $GE = 3x - 2$, and G is the midpoint of \overline{BE} , find the value of x . _____
3. $AB +$ _____ $= AC$
4. How many lines parallel to \overleftrightarrow{FD} can be drawn through A ? _____
5. The sum of the measures of the angles of quad. $ABGF$ is _____.
6. Name an angle congruent to $\angle ACF$. _____
7. Name an angle congruent to $\angle BGF$. _____
8. If $AB = ED$ and $BC = FE$, then $AC =$ _____.
9. $m\angle BCF + m\angle FCE = m\angle$ _____.
10. Can you conclude from the figure that $\overline{AC} \perp \overline{CD}$? _____
11. If $m\angle ACE = 6x + 9$ and $m\angle CEF = 10x - 5$, find the value of x . _____
12. Describe the intersection of \overleftrightarrow{FB} and \overleftrightarrow{AC} . _____
13. Another name for \overline{AB} is _____.
14. Name a complement of $\angle ABF$. _____
15. Write the converse of "If $x < 0$, then $-x > 0$." _____
16. Each exterior angle of a regular convex 18-sided polygon has measure _____.

17. Complete the proof.

Given: $\overline{WX} \parallel \overline{ZY}$; $\overline{WZ} \parallel \overline{XY}$

Prove: $\angle W \cong \angle Y$



Proof:

Statements	Reasons
1. $\overline{WX} \parallel \overline{ZY}$; $\overline{WZ} \parallel \overline{XY}$	1. _____
2. $\angle WXZ \cong \angle XZY$; $\angle WZX \cong \angle ZXY$	2. _____
3. $\angle W \cong \angle Y$	3. _____

Practice 21

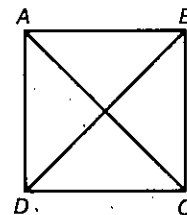
Cumulative Practice, Chapters 4–5

Complete.

- If $\triangle TOP \cong \triangle HAT$, then $\angle P \cong$ _____, $\overline{TP} \cong$ _____, and $\triangle TPO \cong$ _____.
- In $\triangle TRI$, $\overline{TR} \cong \overline{TI}$. Then \angle _____ $\cong \angle$ _____.
- In trapezoid $TRAP$, $\overline{TR} \parallel \overline{PA}$. If $TR = 26$ and the median of $TRAP$ has length 32, then $PA =$ _____.
- Name five theorems or postulates that can be used to prove two triangles congruent. _____
- In $\triangle RST$, if X is the midpoint of \overline{ST} and $\overline{YX} \perp \overline{ST}$, then \overline{YX} is a(n) _____ of \overline{ST} .

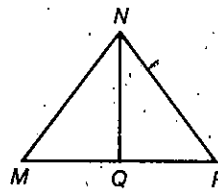
Give the name that best describes quadrilateral $ABCD$.

- $\overline{AB} \cong \overline{DC}$, $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \cong \overline{BC}$, and $\overline{AD} \perp \overline{DC}$. _____
- \overline{AC} and \overline{BD} are perpendicular bisectors of each other. _____
- $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \parallel \overline{BC}$, and $\overline{AD} \perp \overline{DC}$. _____
- $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \parallel \overline{BC}$, and $\overline{AD} \cong \overline{BC}$. _____



Name the theorem or postulate that can be used to prove that $\triangle NQM \cong \triangle NQP$ under the given conditions.

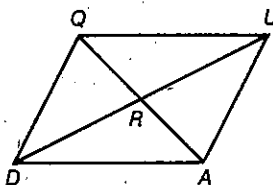
- $\overline{NQ} \perp \overline{MP}$ and Q is the midpoint of \overline{MP} . _____
- $\overline{NQ} \perp \overline{MP}$ and $\overline{NM} \cong \overline{NP}$. _____
- $\overline{NQ} \perp \overline{MP}$ and \overline{NQ} bisects $\angle MNP$. _____



Exs. 10–12

- Given: R is the midpoint of \overline{QU} ;
 $\overline{QD} \parallel \overline{UA}$

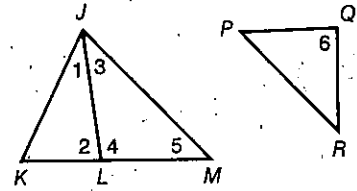
Prove: $\triangle QAD \cong \triangle AQR$



Practice 29

Cumulative Practice, Chapters 6-7

Exercises 1-7 refer to the diagram at the right.



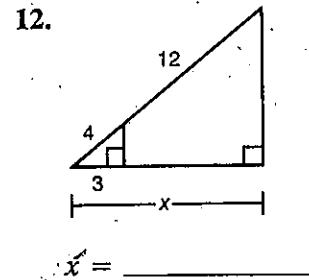
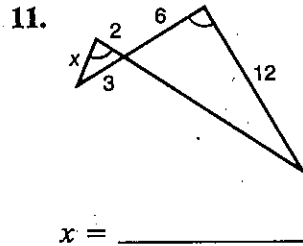
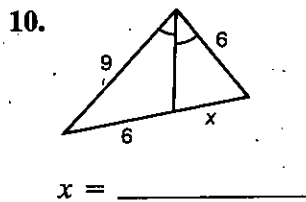
Exs. 1-7

1. $m\angle$ _____ $>$ $m\angle 5$
2. If $JL > LM$, then $m\angle 3$ _____ $m\angle 5$.
3. If \overline{JL} bisects $\angle KJM$, then $\frac{KL}{LM} =$ _____.
4. If $JK = 5$ and $JM = 8$, then $KM >$ _____ and $KM <$ _____.
5. If $\frac{QP}{LJ} = \frac{QR}{LM}$ and $\angle 4 \cong \angle 6$, then $\triangle QPR \sim \triangle$ _____.
6. If $\triangle JKL \sim \triangle QPR$, then $\frac{QP}{QR} =$ _____.
7. If $\overline{QP} \cong \overline{JK}$, $\overline{QR} \cong \overline{JL}$, and $m\angle 1 > m\angle 6$, then KL _____ PR .

Complete.

8. The ratio of 150 cm to 2 m is _____.
9. If $\frac{a}{b} = \frac{c}{d}$, then $\frac{b}{a} =$ _____.

Find the value of x .



Exercises 13-15 refer to the following statement: All squares are rectangles.

13. Write the statement in if-then form. _____

14. Write the contrapositive of the statement. _____

15. What can you conclude by using the given statement together with the following statement: $ABCD$ is not a rectangle?

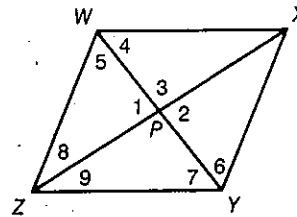
16. Suppose you plan to write an indirect proof of the statement: If $\overline{XY} \cong \overline{XZ}$, then $\angle Z \cong \angle Y$. Write a correct first sentence of the indirect proof.

17. If $\frac{x+3}{3x+2} = \frac{3}{8}$, then $x =$ _____.

Practice 30

Cumulative Practice, Chapters 1-7

Complete each statement. In Exercises 1-14 refer to the diagram.
(The diagram is *not* drawn to scale.)



Exs. 1-14

1. The sides of $\angle 7$ are _____ and _____.
2. If $m\angle 1 = 4x - 5$ and $m\angle 2 = 3x + 6$, then $m\angle 3 =$ _____. (numerical answer)
3. Two angles supplementary to $\angle 3$ are _____ and _____.
4. If $\overline{WX} \parallel \overline{ZY}$, then $\angle 4 \cong$ _____.
5. If $\overline{WZ} \parallel \overline{XY}$, then $\angle WZY$ is supplementary to _____.
6. If $\angle 5 \cong \angle 6$, then _____ and _____ are parallel.
7. $m\angle 1 + m\angle 5 + m\angle 8 =$ _____ (numerical answer)
8. If $m\angle 5 = 51$ and $m\angle 8 = 40$, then $m\angle 3 =$ _____.
9. If P is the midpoint of \overline{ZX} , then \overline{WP} is a(n) _____ of $\triangle WZX$.
10. If $WXYZ$ is a parallelogram and $WP = 5$, then $WY =$ _____.
11. If $WXYZ$ is a rhombus, then _____ and _____ are perpendicular.
12. If $WZ > WP$, then $m\angle 8$ _____ $m\angle 1$.
13. P , W , and _____ are collinear points.
14. If $\overline{WZ} \cong \overline{ZY}$ and $m\angle 8 > m\angle 9$, then WP _____ PY .
15. If $\frac{a}{b} = \frac{c}{d}$, then $\frac{c+d}{d} =$ _____.
16. In right triangle ABC , if P is the midpoint of hypotenuse \overline{AB} , then _____ = _____ = _____.
17. The bisector of the vertex angle of an isosceles triangle is also a(n) _____, a(n) _____, and a(n) _____ of the triangle.
18. A point on the bisector of an angle is equidistant from _____.
19. If B is on \overline{AC} , with $AB = 5x - 2$, $BC = 4x + 7$, and $AC = 50$, then $x =$ _____.
20. If R is in the interior of $\triangle XYZ$, and $\angle XYR$ is complementary to $\angle RYZ$, then \overline{XY} _____ \overline{YZ} .
21. The sum of the measures of the interior angles of a convex nine-sided polygon is _____.

Practice 30 (continued)

Write the converse, inverse, and contrapositive of the given statement. Then classify each statement as true or false.

Given: If $\triangle ABC \cong \triangle XYZ$, then $\triangle ABC \sim \triangle XYZ$.

22. Converse: _____

23. Inverse: _____

24. Contrapositive: _____

In Exercises 25–34, refer to the diagram. B and G are the midpoints of \overline{AD} and \overline{AE} , respectively. C and F are the midpoints of \overline{BD} and \overline{GE} , respectively.

25. If $m\angle A = 70$ and $m\angle D = 60$, the longest side of $\triangle ADE$ is _____.

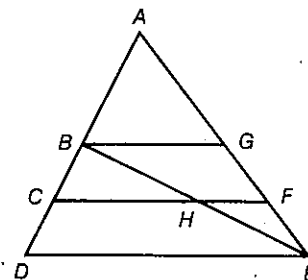
26. The best name to describe quad. $CFED$ is _____.

27. If $BG = 7$ and $CF = 10$, then $DE =$ _____.

28. Name three parallel lines in the figure. _____, _____, and _____.

29. Name two triangles similar to $\triangle ABG$. _____ and _____.

30. Compare the lengths of \overline{BH} and \overline{HE} . _____



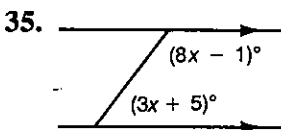
Exs. 25–34

Identify each pair of angles in the figure as vertical, corresponding, alternate interior, or same-side interior angles.

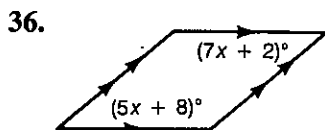
31. $\angle GBD, \angle FCD$ _____ 32. $\angle GBE, \angle BED$ _____

33. $\angle GBD, \angle FCB$ _____ 34. $\angle BHC, \angle FHE$ _____

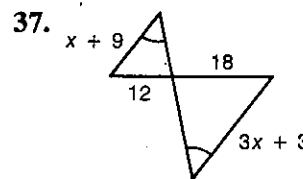
Find the value of x .



$x =$ _____



$x =$ _____

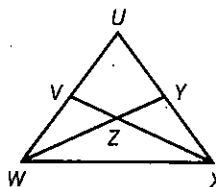


$x =$ _____

38. Given: $\overline{UW} \cong \overline{UX}$; \overline{XV} and \overline{WY} are medians:

Prove: $\triangle VZW \cong \triangle YZX$

List the key steps of a proof.



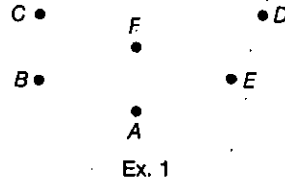
Mixed Review

Chapters 1-3

Directions: Write answers in the spaces provided.

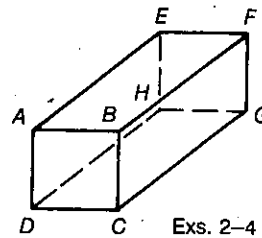
Exercise 1 refers to the diagram at the right.

1. Name the point(s) that appear(s) to be equidistant from B , C , and E . _____



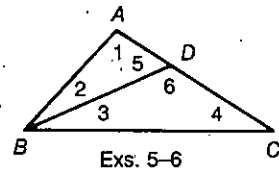
Exercises 2-4 refer to the diagram at the right.

2. Of the lines shown, name the lines that do *not* intersect plane $BCGF$. _____
3. Identify the intersection of planes $EFGH$ and $AEHD$. _____
4. Are A , D , G , and E coplanar? _____



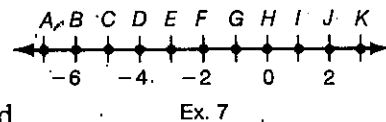
Exercises 5 and 6 refer to the diagram at the right.

5. \overline{BD} bisects $\angle ABC$ and $m\angle 2 = 24$. Find $m\angle ABC$. _____
6. Name the vertex and the sides of $\angle 2$.
vertex _____ sides _____



7. Use the diagram to find the distance from the midpoint of \overline{AG} to K . _____
8. a. The measures of the angles of a triangle are $2x - 3$, $3x - 4$, and $4x - 2$. Find the measure of each angle.

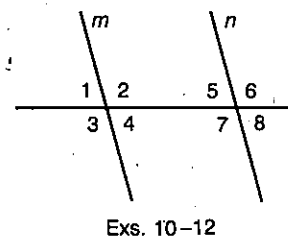
- b. Is the triangle acute, right, or obtuse? _____



9. If $\angle A$ and $\angle B$ are complementary and the measure of $\angle A$ is four times the measure of $\angle B$, find the measure of $\angle B$. _____

Exercises 10-12 refer to the diagram at the right.

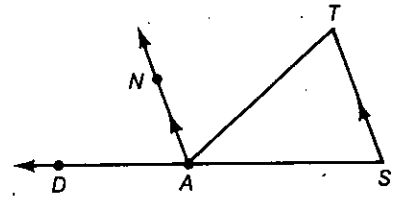
10. Classify each pair of angles as alternate interior, same-side interior, or corresponding angles.
- a. $\angle 1$ and $\angle 5$ _____ b. $\angle 4$ and $\angle 5$ _____
11. If $m \parallel n$ and $m\angle 1 = 90$, find $m\angle 7$. _____
12. If $m \parallel n$ and $m\angle 4 = 60$, find $m\angle 7$. _____
13. Find the measure of each angle of a regular octagon. _____



(continued)

Mixed Review (continued)

14. Complete the proof by supplying the missing reasons.

Given: $\overline{ST} \parallel \overline{AN}$; \overline{AN} bisects $\angle TAD$.Prove: $\angle T \cong \angle S$ 

Proof:

Statements	Reasons
1. $\overline{ST} \parallel \overline{AN}$	1. _____
2. $\angle T \cong \angle TAN$	2. _____
3. $\angle DAN \cong \angle S$	3. _____
4. \overline{AN} bisects $\angle TAD$.	4. _____
5. $\angle TAN \cong \angle DAN$	5. _____
6. $\angle T \cong \angle S$	6. _____

- 15.
- $\angle R$
- and
- $\angle S$
- are supplementary angles,
- $m\angle R = 7x + 5$
- , and
- $m\angle S = 6x + 6$
- . Find the measures of both angles.

 $m\angle R =$ _____, $m\angle S =$ _____

16. a. Rewrite the statement, "
- $\frac{1}{x}$
- is defined if
- $x \neq 0$
- ," as an if-then statement. _____

b. Write the converse of the statement. _____

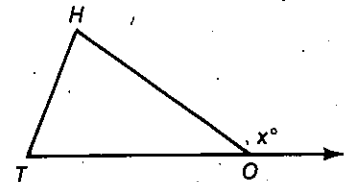
17. Predict the next two numbers of the sequence:
- $1, -\frac{1}{3}, \frac{1}{9}, -\frac{1}{27}, \dots$

_____, _____

18. In quadrilateral
- $EFGH$
- ,
- $m\angle E = 2x$
- ,
- $m\angle F = 4x + 22$
- , and

 $m\angle G = 3x - 3$. Find the value of x that makes $\overline{EF} \parallel \overline{GH}$. _____

19. If
- $m\angle T = 68$
- and
- $m\angle H = 76$
- , find the value of
- x
- . _____



Ex. 19

20. Tell whether the reasoning pattern is deductive or inductive:
-
- Alison observes that February has had 28 days for the past three years. She concludes that next February will also have 28 days.

Mixed Review

Chapters 1-5

Directions: Write answers in the spaces provided.

1. Write the converse of the following statement: "If oranges are sold at four for 99¢, then each orange costs less than 25¢."
- _____
- _____

2. Quad. *ROCK* is a rectangle. If $m\angle 1 = 30$, find the measures of $\angle 2$, $\angle 3$, and $\angle 4$.

$m\angle 2 =$ _____, $m\angle 3 =$ _____, $m\angle 4 =$ _____

3. $\triangle HIJ$ is isosceles with $HI = 3x + 2$, $IJ = 2x + 8$, and $HJ = 4x$.

List the three possible lengths of \overline{IJ} . _____

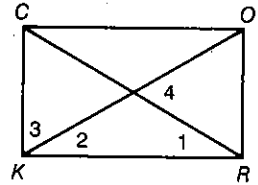
4. The measure of $\angle U$ is 20 less than 3 times the measure of its supplement. Find the measure of $\angle U$. _____

5. \overline{AC} bisects \overline{BD} and $\overline{AC} \perp \overline{BD}$. Write the reasons that justify the key steps in proving that $\triangle ABC \cong \triangle ADC$.

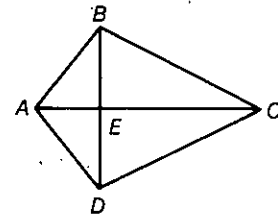
- a. $\triangle AEB \cong \triangle AED$ _____
- b. $\triangle BEC \cong \triangle DEC$ _____
- c. $\overline{AB} \cong \overline{AD}$; $\overline{BC} \cong \overline{DC}$ _____
- d. $\triangle ABC \cong \triangle ADC$ _____

6. Quad. *EFGH* is a parallelogram. Find the values of x and y .

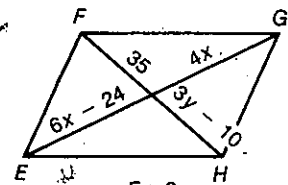
$x =$ _____, $y =$ _____



Ex. 2



Ex. 5

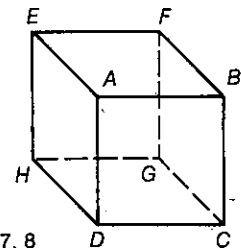


Ex. 6

Exercises 7 and 8 refer to the diagram at the right.

7. Name a plane that contains \overleftrightarrow{AG} that is *not* shown in the diagram.
- _____

8. Name all lines shown that are skew to \overleftrightarrow{DH} . _____

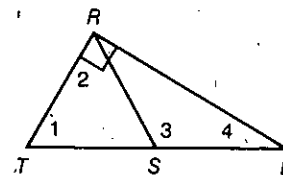


Exs. 7, 8

9. \overline{RS} is a median of $\triangle RET$. If $m\angle 1 = 60$, find the measures of $\angle 2$, $\angle 3$, and $\angle 4$.

$m\angle 2 =$ _____, $m\angle 3 =$ _____,

$m\angle 4 =$ _____



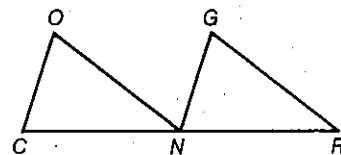
Ex. 9

(continued)

Mixed Review (continued)

10. Name the regular polygon whose exterior angles each measure 72.

11. Given $\overline{OC} \parallel \overline{GN}$, $\overline{CN} \cong \overline{NR}$, and $\overline{ON} \parallel \overline{GR}$. What postulate can be used to prove that $\triangle CON \cong \triangle NGR$?



Ex. 11

12. If P is equidistant from \overrightarrow{RS} and \overrightarrow{RT} , then P lies on the _____.

13. Quad $ABCD$ is a rhombus with $m\angle 1 = 35$. Find the measures of $\angle 2$, $\angle 3$, $\angle 4$, and $\angle 5$.

$m\angle 2 =$ _____, $m\angle 3 =$ _____,

$m\angle 4 =$ _____, $m\angle 5 =$ _____

14. $\triangle ABC$ is a triangle with $m\angle A = 70$. If \overline{AD} bisects $\angle A$, find the measure of $\angle BAD$. _____

15. $PARE$ is a quadrilateral with $\overline{AR} \cong \overline{PE}$. State an additional fact that would allow you to prove that $PARE$ is a parallelogram.

16. $\angle 5$ and $\angle 6$ are corresponding angles formed by a transversal and two parallel lines. If $m\angle 5 = 4x + 20$ and $m\angle 6 = 8x - 40$, find the numerical measures of $\angle 5$ and $\angle 6$. _____

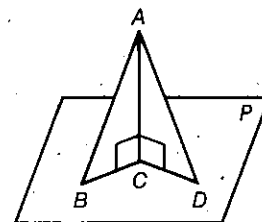
17. In $\triangle LOT$, $\angle O$ and $\angle T$ are complementary. What kind of triangle is $\triangle LOT$? _____

18. $\triangle ABC \cong \triangle DEF$. Why is $\angle C \cong \angle F$? _____

19. $\triangle ABC$ and $\triangle DEF$ are congruent with $m\angle C = m\angle F = 90$. If $m\angle A = 40$, find the measures of $\angle B$, $\angle D$, and $\angle E$.

$m\angle B =$ _____, $m\angle D =$ _____, $m\angle E =$ _____

20. $\overline{AC} \perp$ plane P and $\overline{AD} \cong \overline{AB}$. Name the congruence theorem that allows you to prove $\triangle ABC \cong \triangle ADC$.



Ex. 20

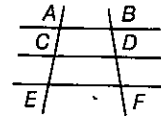
21. In $\triangle XYZ$, $\angle X \cong \angle Z$. If $XY = 3t + 12$ and $YZ = 7t + 2$, find the value of t . _____

Mixed Review

Chapters 1-7

Directions: Write answers in the spaces provided.

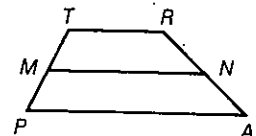
1. $\overline{AB} \parallel \overline{CD} \parallel \overline{EF}$ and $BD = DF$. If $AC = 7$, find AE . _____



Ex. 1

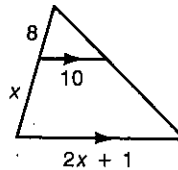
2. Name the property that justifies the statement "If $y + 7 = 19$, then $y = 12$."

3. $\triangle RGT$ is an isosceles right triangle with right angle G . \overline{GX} is a perpendicular from G to \overline{RT} . Which method(s) could you use to prove $\triangle XGR \cong \triangle XGT$? _____



Ex. 4

4. \overline{MN} is the median of trapezoid $TRAP$. If $TR = 16$ and $PA = 38$, find MN . _____



5. Find the value of x . _____

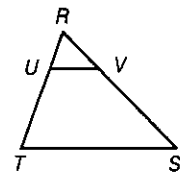
6. Assume the two statements "Whenever Jack Laughton drives, we are late" and "We were on time" are true. What, if anything, can you conclude? _____

7. X is a point on \overline{AE} such that $AE = 13$, $AX = 3y - 5$, and $XE = 2y - 2$. Is X the midpoint of \overline{AE} ? _____

8. In quadrilateral $ABCD$, $\overline{AD} \parallel \overline{BC}$, $m\angle D = 90$, $m\angle C = x + 15$, and $m\angle B = 2x + 15$. Find $m\angle A$. _____

9. A , B , and C are in the intersection of planes M and P . What is the relationship between A , B , and C ? _____

10. In $\triangle RST$, $\overline{UV} \parallel \overline{TS}$. What postulate allows you to conclude that $\triangle RUV \sim \triangle RTS$?



Ex. 10

11. What is the correct first sentence for an indirect proof of the conditional "If $\angle A \neq \angle B$, then $\overline{AC} \neq \overline{BC}$."

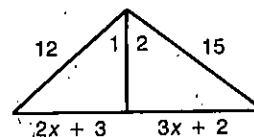
12. $\angle A$ and $\angle B$ are alternate interior angles formed by a transversal of two parallel lines. If $m\angle A = 12x + 2$ and $m\angle B = 9x + 20$, find the measures of $\angle A$ and $\angle B$. _____

(continued)

Mixed Review (continued)

13. Two sides of a triangle are 7 cm and 11 cm long. The third side of the triangle must be longer than _____ cm and shorter than _____ cm.

14. In the diagram, if $\angle 1 \cong \angle 2$, find the value of x . _____

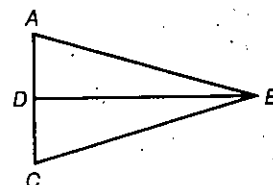


Ex. 14

15. $\triangle ABC$ is isosceles with median \overline{BD} . If $CD = 4x - 2$, and

$DA = 10 + x$, find the value of CA . _____

16. $\triangle ABC$ is isosceles, $\overline{AB} \cong \overline{BC}$, and $\overline{BD} \perp \overline{CA}$. Name three pairs of congruent angles. _____



Exs. 15, 16

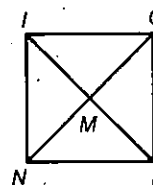
17. One angle of an isosceles trapezoid measures 72. Find the measures of the other angles. _____

18. Predict the next two numbers in the sequence: 8, 4, $\frac{4}{3}$, $\frac{1}{3}$,

19. In $\triangle MNO$ and $\triangle PQR$, $MN = 7$, $NO = 12$, $MO = 10$, $PQ = 10.5$, $QR = 15$, and $PR = 18$.

- a. Must the two triangles be similar? _____
- b. What theorem or postulate justifies your answer to part (a)? _____

20. Quad. $NICE$ is a square. If $ME = 6x - 15$ and $MI = 3x$, find the value of x . _____



Ex. 20

In Exercises 21 and 22, $QUAD$ is a parallelogram with diagonals intersecting at P .

21. If $QP = 5x - 4$, $PA = 4x + 16$, and $DU = 6x + 8$, find the value of DU . _____

22. If $QD > QU$, then which angle is larger, $\angle DPQ$ or $\angle QPU$? _____

23. The measure of the supplement of an angle is 4 more than 3 times the measure of the angle. Find the measures of the angle, its complement, and its supplement. _____

24. The measure of each interior angle of a regular polygon is 5 times the measure of an exterior angle. How many sides does the polygon have? _____

(continued)

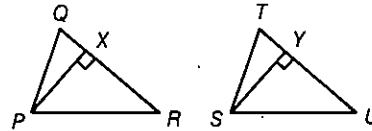
Mixed Review (continued)

25. The ratio of the measures of the angles of a triangle is 3:5:4. Find the measure of each angle. _____
26. In $\triangle ABC$, $m\angle A = 3x + 9$, $m\angle B = 4x - 6$, and $m\angle C = 2x + 24$. Name the longest side of $\triangle ABC$. _____
27. In quadrilateral $ABCD$, if $m\angle C = 72$, find a measure for $\angle D$ that guarantees that $\overline{AD} \parallel \overline{BC}$. _____
28. Find the distance between two points on a number line whose coordinates are -5 and 23 . _____
29. Supply the missing reasons for the key steps in the proof.

Given: $\triangle PQR \cong \triangle STU$;
 \overline{PX} and \overline{SY} are altitudes.

Prove: $\overline{PX} \cong \overline{SY}$

Key steps of proof:



- a. $\overline{PQ} \cong \overline{ST}$; $\angle Q \cong \angle T$ a. _____
- b. $\angle PXQ \cong \angle SYT$ b. _____
- c. $\triangle PXQ \cong \triangle SYT$ c. _____
- d. $\overline{PX} \cong \overline{SY}$ d. _____
30. $\triangle ABC \sim \triangle DEF$
- a. If $AB = 9$, $BC = 12$, $DE = 15$, and $DF = 18$, find EF and AC .
 $EF =$ _____, $AC =$ _____
- b. What is the scale factor of $\triangle ABC$ to $\triangle DEF$? _____
31. $PART$ is a quadrilateral with $\angle P \cong \angle R$. What additional information would be needed to prove that $PART$ is a parallelogram?

32. In $\triangle ABC$, $\angle A$ and $\angle B$ are complementary angles and $AB > BC > AC$. What kind of triangle is $\triangle ABC$? _____
33. In $\triangle TRI$, $\overline{TR} \cong \overline{TI}$ and $m\angle T = 38$. Find the measures of $\angle R$ and $\angle I$.
 $m\angle R =$ _____, $m\angle I =$ _____
34. Complete: If $\frac{x}{3} = \frac{y}{5}$, then $\frac{x+3}{3} =$ _____.
35. Find the value of x if $\frac{x+3}{3} = \frac{x+2}{4}$. _____
36. Given the following statement: " $\frac{1}{x} > 0$ if $x > 0$."
- a. Write the converse. _____
- b. Write the contrapositive. _____

Preparing for College Entrance Exams

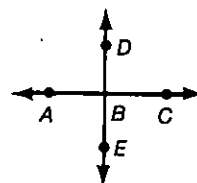
Chapter 1

Directions: Write the letter of the best answer in the space provided.

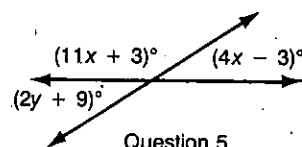
- Points $A, B, C,$ and D are coplanar. $A, B,$ and C are collinear but $B, C,$ and D are not. How many different lines are determined by points $A, B, C,$ and D ?
 (A) 3 (B) 4 (C) infinitely many
 (D) cannot be determined from the information given
- j and k are intersecting lines. A and B are points on $j,$ and C and D are points on $k.$ How many planes contain points $A, B, C,$ and D ?
 (A) none (B) exactly one (C) infinitely many
 (D) cannot be determined from the information given
- Points $M, A, T, H,$ and P are arranged on a line so that T is the midpoint of $\overline{HM},$ M is the midpoint of $\overline{HA},$ and P is the midpoint of $\overline{AT}.$ Which of the following are true?
 I. P is on $\overline{MA}.$ II. M is on $\overline{TH}.$ III. $PH = TA$
 (A) I only (B) II only (C) III only
 (D) I and II only (E) I, II, and III
- In the figure, $AC = 24, AB = 6x - 6, BC = 5x - 3,$ and $BE = 3x + 2.$ Which do you know is true?
 I. \overline{AC} bisects $\overline{DE}.$
 II. \overline{DE} bisects $\overline{AC}.$
 III. \overline{DE} bisects $\overline{AC}.$
 (A) I only (B) II only (C) III only
 (D) I and II only (E) II and III only
- Find the values of x and $y.$ (The figure is not drawn to scale.)
 (A) $x = 20, y = 34$ (B) $x = 10, y = 52$
 (C) $x = 12, y = 18$ (D) $x = 11, y = 7$
- Point A lies in plane $K,$ but point B does not. A line l through B intersects K at point $C.$ Which of the following must be true?
 I. $A, B,$ and C are coplanar.
 II. The midpoint of \overline{AB} lies in plane $K.$
 III. The midpoint of \overline{AC} lies in plane $K.$
 (A) I only (B) II only (C) III only
 (D) I and II only (E) I and III only
- In the figure, \overline{BD} bisects $\angle ABE, \overline{BE}$ bisects $\angle ABG,$ $m\angle EBF = 37,$ and $m\angle CBG = 44.$ Find $m\angle DBF.$ (The figure is not drawn to scale.)
 (A) 68 (B) 34 (C) 82 (D) 71

Answers

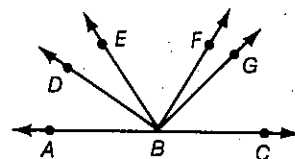
- _____
- _____
- _____
- _____
- _____
- _____
- _____



Question 4



Question 5



Question 7

Preparing for College Entrance Exams

Chapter 2

Directions: Write the letter of the best answer in the space provided.

1. Which of the following statements is equivalent to the statement "p implies q"?

- (A) p if and only if q. (B) If p, then q. (C) q only if p.
 (D) p if q. (E) none of these

2. If $4x = 9 - \frac{1}{2}x$, which of the following must be true?

- I. $4x - 9 = \frac{1}{2}x$
 II. $4x - \frac{1}{2}x = 9$
 III. $8x = 18 - x$
 IV. $\frac{1}{2}x = 9 - 4x$

- (A) I only (B) II only (C) III only
 (D) II and III only (E) III and IV only

3. The measure of the supplement of an angle is 14 less than 3 times the measure of the complement. Find the measure of the complement.

- (A) 38 (B) 52 (C) 142 (D) 19 (E) none of these

4. Which of the following must be known to be true to prove that $BC < CD$?

- I. $AB = CD$
 II. $BC < AB$
 III. $AB + BC + CD = AD$

- (A) I only (B) II only (C) I and II only
 (D) II and III only (E) I, II, and III

5. $\angle ABC$ and $\angle CBD$ are adjacent congruent angles, and $m\angle ABD = 160$. What are the two possible measures for $\angle ABC$?

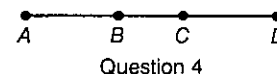
- (A) 80, 160 (B) 100, 160 (C) 80, 100
 (D) 90, 180 (E) 160, 200

6. If $abc = 3$ and $a = b$, then c equals which of the following?

- (A) $\frac{3}{a^2}$ (B) $3 - a^2$ (C) $3 - 2a$
 (D) $3 + 2a$ (E) $\frac{3}{2a}$

Answers

1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____



Preparing for College Entrance Exams

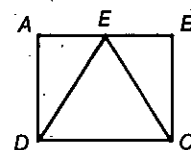
Chapter 3

Directions: Write the letter of the best answer in the space provided.

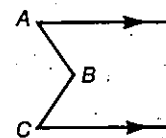
- Use inductive reasoning to determine a formula for the number of regions into which a circle is divided by n diameters.
(A) $n + 1$ (B) 2^n (C) $2n + 2$ (D) $2n$
- A and B are regular polygons and A has 2 more sides than B . The measure of each interior angle of A is 6 greater than the measure of the interior angle of B . How many sides does A have?
(A) 6 (B) 8 (C) 10 (D) 12
- Planes K and J are parallel. Line p lies in plane K and line q lies in plane J . Which of the following statements must be true?
(A) p and q are always parallel. (B) p and q are sometimes parallel.
(C) p and q are never parallel. (D) p and q are always coplanar.
(E) p and q sometimes intersect.
- $\overline{AD} \perp \overline{DC}$, $\overline{AB} \parallel \overline{DC}$, \overline{DE} bisects $\angle ADC$, and $m\angle ECB = 40$. Find $m\angle DEC$. (The figure is not drawn to scale.)
(A) 90 (B) 95 (C) 85
(D) cannot be determined from the information given
- Find $m\angle ABC$ if $m\angle A = 48$ and $m\angle C = 46$. (The figure is not drawn to scale.)
(A) 94 (B) 86 (C) 84
(D) cannot be determined from the information given
- Find $m\angle ADC$. (The figure is not drawn to scale.)
(A) 53 (B) 43 (C) 137 (D) 127
- In the figure, $m\angle ABE = m\angle EDF = m\angle BEC$. Which of the following pairs of lines must be parallel?
I. \overleftrightarrow{AB} and \overleftrightarrow{CD} II. \overleftrightarrow{BE} and \overleftrightarrow{DF} III. \overleftrightarrow{AE} and \overleftrightarrow{CF}
(A) I only (B) II only (C) III only
(D) I and II only (E) I and III only
- In $\triangle ABC$, \overline{BD} and \overline{CD} are angle bisectors, and $\overline{CE} \parallel \overline{BD}$. If $m\angle BAC = 70$, what is $m\angle DCE$?
(A) 70 (B) 105 (C) 125 (D) 153.5

Answers

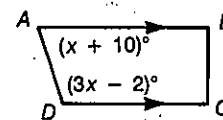
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____



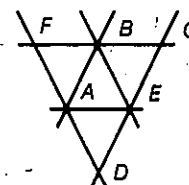
Question 4



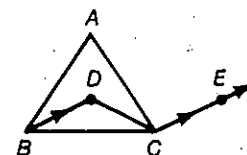
Question 5



Question 6



Question 7



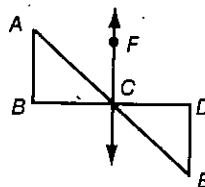
Question 8

Preparing for College Entrance Exams

Chapter 4

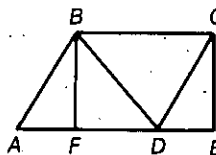
Directions: Write the letter of the best answer in the space provided.

1. $\overline{AB} \perp \overline{BD}$, $\overline{AB} \parallel \overline{DE}$, \overline{CF} bisects \overline{AE} and \overline{BD} , and $AB = DE$. What can you conclude?
 (A) $\triangle ABC \cong \triangle DEC$ (B) $\triangle ABC \cong \triangle EDC$
 (C) $\triangle ABC \cong \triangle CDE$ (D) none of these



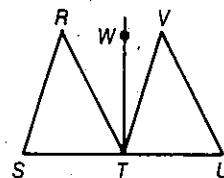
Question 1

2. $\overline{AB} \parallel \overline{CD}$, $AB = CD$, and $AF = FD = DE$. What can you conclude? (Figure is not drawn to scale.)
 I. $\triangle ABF \cong \triangle DCE$
 II. $\triangle ABF \cong \triangle DBF$
 III. $\triangle DBF \cong \triangle DCE$
 (A) I only (B) II only
 (C) III only (D) I, II, and III



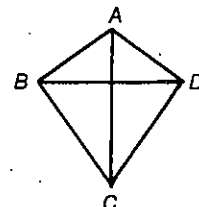
Question 2

3. $\overline{SR} \parallel \overline{TV}$, $\overline{TR} \cong \overline{UV}$, and \overline{TW} bisects both \overline{SU} and $\angle RTV$. What can you conclude?
 (A) The SAS Postulate can be used to prove that $\triangle RST \cong \triangle VTU$.
 (B) The ASA Postulate can be used to prove that $\triangle RST \cong \triangle VTU$.
 (C) The SSS Postulate can be used to prove that $\triangle RST \cong \triangle VTU$.
 (D) There is not sufficient information to prove that $\triangle RST \cong \triangle VTU$.
4. \overline{AC} bisects $\angle BAD$, $\overline{AB} \perp \overline{BC}$, and $\overline{AD} \perp \overline{CD}$. The given information is sufficient to prove which of the following?
 I. $\overline{AC} \perp \overline{BD}$
 II. \overline{AC} bisects \overline{BD} .
 III. $\overline{AB} \parallel \overline{CD}$



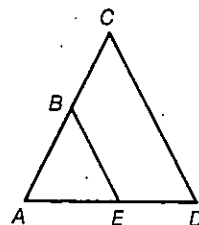
Question 3

- (A) I only (B) II only (C) III only
 (D) I and II only (E) II and III only



Question 4.

5. $P, Q,$ and R are collinear points with $PQ = QR$. Point S is equidistant from \overline{QP} and \overline{QR} . Which of the following must be true?
 I. $\triangle PQS \cong \triangle RQS$
 II. S lies on the perpendicular bisector of \overline{PR} .
 III. S is equidistant from P and R .
 (A) I only (B) II only (C) I and II only
 (D) I and III only (E) I, II, and III
6. $BA = BE$, $\overline{BE} \parallel \overline{CD}$, and $m\angle ACD = 56$. Find $m\angle ADC$.
 (A) 56 (B) 62 (C) 68 (D) 124
 (E) cannot be determined from the information given



Question 6

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Preparing for College Entrance Exams

Chapter 5

Directions: Write the letter of the best answer in the space provided.

1. In quadrilateral $TUVW$, $\overline{TW} \parallel \overline{UV}$. What additional information is needed to prove that \overline{TV} bisects \overline{WU} ?

- I. $\overline{TU} \parallel \overline{WV}$
- II. $TW = UV$
- III. $TU = WV$

- (A) I only
- (B) II only
- (C) III only
- (D) I or II
- (E) I or II or III

2. A rhombus is also a square only if it is also a(n):

- (A) parallelogram
- (B) trapezoid
- (C) rectangle
- (D) equilateral quadrilateral
- (E) convex polygon

3. $ABCD$ is a quadrilateral with $m\angle A = 2x$, $m\angle B = 3x - 15$, $m\angle C = 4x - 90$, and $m\angle D = x + 15$. What can you conclude?

- I. $m\angle A = 90$
- II. $ABCD$ is a rectangle.
- III. $ABCD$ is a parallelogram.

- (A) I only
- (B) I and III only
- (C) III only
- (D) I, II, and III
- (E) none of these

4. B and G are the midpoints of \overline{AC} and \overline{AF} , respectively. C and F are the midpoints of \overline{BD} and \overline{GE} , respectively. $BGED$ is a trapezoid. If $CF = 36$, find DE .

- (A) 54
- (B) 72
- (C) 45
- (D) cannot be determined from the information given

5. $\overline{RS} \parallel \overline{UT}$, $RV = VT$, and \overline{RT} bisects $\angle URS$. Which of the following best describes $RSTU$? (The figure is not drawn to scale.)

- (A) parallelogram
- (B) rhombus
- (C) rectangle
- (D) square
- (E) none of these

6. For quadrilateral $WXYZ$ it is known that $WX = YZ$. Which of the following additional pieces of information is *not* sufficient to prove that $WXYZ$ is a parallelogram?

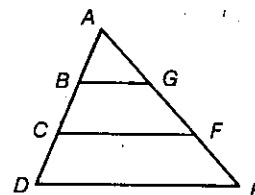
- (A) $\overline{WX} \parallel \overline{YZ}$
- (B) $XY = WZ$
- (C) $\overline{XY} \parallel \overline{WZ}$
- (D) $\angle W$ is supplementary to $\angle Z$.
- (E) \overline{WY} is the perpendicular bisector of \overline{XZ} .

7. $ABEG$ is a rectangle. \overline{HC} bisects \overline{AF} and \overline{BD} . Find the value of the expression $\frac{BD}{CE} \cdot \frac{AF}{HG}$.

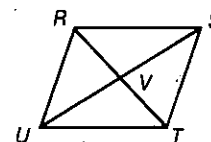
- (A) 1
- (B) 2
- (C) 4
- (D) cannot be determined from the information given

Answers

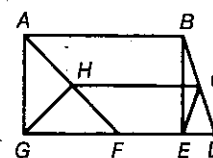
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____



Question 4



Question 5



Question 7

Preparing for College Entrance Exams

Chapter 6

Directions: Write the letter of the best answer in the space provided.

- For which of the following statements are the statement, its contrapositive, its converse, and its inverse all true?
 - If $a > 1$, then $a^2 > a$.
 - Vertical angles are congruent.
 - If two lines form congruent adjacent angles, then the lines are perpendicular.

(A) I only (B) II only (C) III only
 (D) I and III only (E) I, II, and III
- In $\triangle ABC$, $AB = 7$ and $BC = 10$. AC cannot equal:

(A) 7 (B) 10 (C) 3.14 (D) 17 (E) $\frac{34}{3}$
- In $\triangle ABC$, $m\angle A = 60$ and $m\angle DBC = 31$. \overline{BD} bisects $\angle ABC$ and \overline{CD} bisects $\angle ACB$. Which side of $\triangle ABC$ is the longest? (The figure is not drawn to scale.)

(A) \overline{BD} (B) \overline{DC} (C) \overline{AC}
 (D) cannot be determined from the information given
- Based on the information in the diagram at the right, which of the following is true? (The figure is not drawn to scale.)

(A) $d > a > e > c > b$ (B) $d > e > c > b > a$
 (C) $e > a > b > c > d$ (D) $d > a > e > b > c$

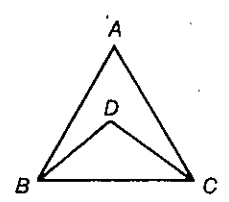
Questions 5–7 each consist of two quantities, one in Column A and one in Column B. Figures may not be drawn to scale. Compare the two quantities and in the answer blank write:

- (A) if the quantity in Column A is greater.
 (B) if the quantity in Column B is greater.
 (C) if the two quantities are equal.
 (D) if the relationship cannot be determined from the information given.

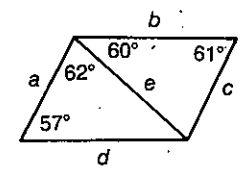
	Column A	Column B
5.	$m\angle ACE$	$m\angle BAC$
6.	$m\angle ABC$	$m\angle ACB$
7.	$m\angle 1 + m\angle 4$	$m\angle 2 + m\angle 3$

Answers

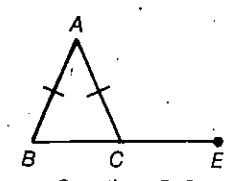
- _____
- _____
- _____
- _____
- _____
- _____
- _____



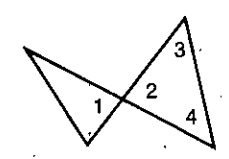
Question 3



Question 4



Questions 5, 6



$m\angle 3 > m\angle 4$
Question 7

Preparing for College Entrance Exams

Chapter 7

Directions: Write the letter of the best answer in the space provided.

1. The ratio of the measures of two supplementary angles is 7:8. Which proportion(s) could you use to find the measures of the angles?

I. $\frac{x}{y} = \frac{7}{8}$

II. $\frac{x}{y} = \frac{8}{7}$

III. $\frac{x}{180-x} = \frac{7}{8}$

IV. $\frac{x}{180-x} = \frac{8}{7}$

- (A) I only (B) II only (C) I and II only
 (D) III and IV only (E) I, II, III, and IV

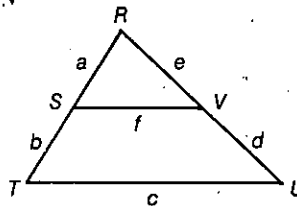
2. S and V are the midpoints of \overline{RT} and \overline{RU} , respectively. Which of the following is not true?

(A) $\frac{c}{f} = \frac{b}{a}$

(B) $\frac{d}{e} = \frac{b}{a}$

(C) $\frac{c}{e+d} = \frac{f}{e}$

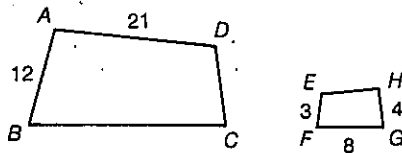
(D) $\frac{f}{a} = \frac{c}{a+b}$



Question 2

3. Quad. $ABCD \sim$ quad. $HGFE$. Find the perimeter of $ABCD$.

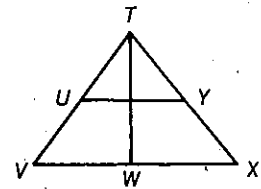
- (A) 88 (B) 22 (C) 66 (D) 31



Question 3

4. In the triangle shown, $\overline{UY} \parallel \overline{VX}$, and \overline{TW} is the perpendicular bisector of both \overline{UY} and \overline{VX} . How many pairs of similar triangles are shown in the figure?

- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7



Question 4

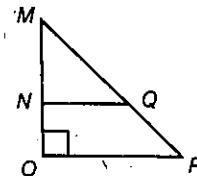
5. Any two equilateral triangles are similar. Which of the following can be used to prove such similarity?

- I. AA Similarity Postulate
 II. SSS Similarity Theorem
 III. SAS Similarity Theorem

- (A) I only (B) II only (C) III only
 (D) I and II only (E) I, II, and III

6. In right $\triangle MOP$, $\overline{NQ} \perp \overline{MO}$. $MN = 9$, $NO = 7$, and $MP = 20$. Find MQ .

- (A) 11.25 (B) 8.75 (C) 7.5 (D) 9.25 (E) 10.75



Question 6

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____