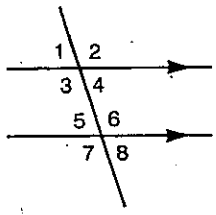
NAME Key DATE _____ SCORE _____

Practice 9

Lessons 3-1 through 3-3

When Lines and Planes Are Parallel

In Exercises 1–4, classify each pair of angles as corresponding, alternate interior, or same-side interior angles.



Exs. 1–8

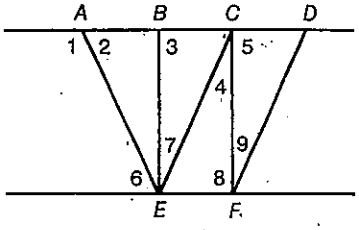
1. $\angle 4$ and $\angle 5$ Alt. Int.
2. $\angle 4$ and $\angle 8$ Corresp.
3. $\angle 3$ and $\angle 5$ S-S Int.
4. $\angle 3$ and $\angle 7$ Corr.
5. Name all angles congruent to $\angle 2$. $\angle 3, \angle 6, \angle 7$
6. Name all angles supplementary to $\angle 6$. $\angle 4, \angle 8, \angle 5, \angle 1$
7. If $m\angle 1 = 35$, then $m\angle 8 =$ 35.
8. If $m\angle 3 = 2x - 5$ and $m\angle 5 = x + 20$, find the value of x. 55

$2x-5+x+20=180$
$3x+15=180$
$3x=165$
$x=55$

Complete each statement with the word *always*, *sometimes*, or *never*.

9. Two lines that do not intersect are sometimes parallel.
10. Two lines perpendicular to a third line are sometimes parallel to each other.
11. Two skew lines are never coplanar.
12. Two lines that lie in parallel planes are sometimes skew.
13. If two parallel lines are cut by a transversal, same-side interior angles are always supplementary.
14. If two parallel planes are cut by a third plane, then the lines of intersection are always parallel.

In Exercises 15–20, use the given information to name the segments that must be parallel. If there are no such segments, write *none*.



Exs. 15–20

15. $\angle 7 \cong \angle 4$ $\overline{BE} \parallel \overline{CF}$
16. $m\angle 4 = m\angle 9$ $\overline{CE} \parallel \overline{DF}$
17. $\angle 1$ is supplementary to $\angle 6$. $\overline{AC} \parallel \overline{EF}$
18. $\overline{EF} \perp \overline{BE}$, $\overline{EF} \perp \overline{CF}$ $\overline{BE} \parallel \overline{CF}$
19. $\angle 7 \cong \angle 9$ none
20. $\angle 3 \cong \angle 5 \cong \angle 8$ $\overline{BE} \parallel \overline{CF}$ & $\overline{AD} \parallel \overline{EF}$

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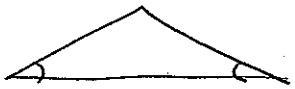
Practice 10
Supplementary Practice

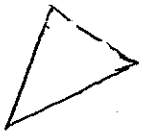
Lessons 3-4, 3-5

Sketch the polygons described. If no such polygon exists, write *not possible.*

1. An obtuse isosceles triangle



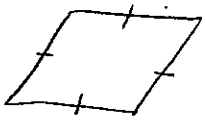
2. An acute scalene triangle



3. An equilateral right triangle

not possible

4. An equilateral quadrilateral that is not equiangular



5. An exterior angle of a right triangle has measure 140. Find the measure of each angle of the triangle. $180 - 140 = 40$

(40, 50, 90)

$180 - (40 + 90) = 50$

6. The angles of a triangle have measures x, $2x$, and $x + 20$. Find the value of x. $x + 2x + x + 20 = 180$

40

7. What is the sum of the measures of the exterior angles of any convex polygon, one at each vertex?

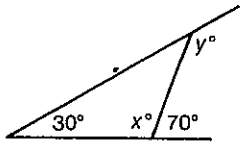
360

8. One exterior angle of a regular polygon has measure 40. How many sides does the polygon have? $\frac{360}{40} = 9$

9

Find the indicated values.

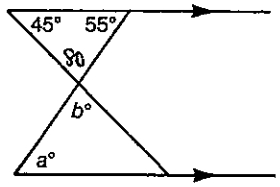
9.



$x =$ 110

$y =$ 140

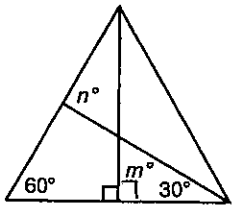
10.



$a =$ 55

$b =$ 80

11.



$m =$ 60

$n =$ 90

12. Complete the table for regular polygons.

Number of sides	6	8	12	18	24
Measure of each exterior angle	60	45	30	20	15
Measure of each interior angle	120	135	150	160	165

$165 = \frac{(n-2)180}{n}$

$165n = 180n - 360$

$-15n = -360$

$n = 24$

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Practice 11

Lessons 3-4 through 3-6

Applying Parallel Lines to Polygons

Complete each statement with the word *always*, *sometimes*, or *never*.

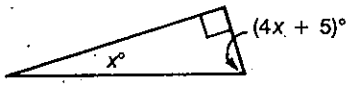
1. An isosceles triangle sometimes has exactly two congruent sides.
2. A conclusion reached by deductive reasoning is true if the hypotheses are true.
3. A 17-sided convex polygon is sometimes equiangular.
4. A conclusion based on several past observations is ~~never~~ true.

Complete.

5. The sum of the measures of the exterior angles of any convex polygon, one at each vertex, is 360.
6. The sum of the measures of the acute angles of a right triangle is 90.
7. The sum of the measures of the angles of a convex polygon with n sides is $(n-2)180$.
8. Each angle of an equiangular quadrilateral has measure 90.

Find the indicated values. The figure in Exercise 11 is a regular hexagon.

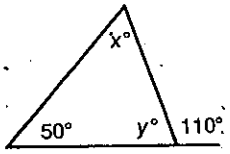
9.



$x =$ 17

$4x+5+x+90=180$
$5x+95=180$
$x=$

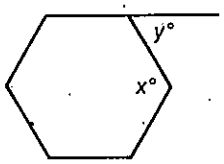
10.



$x =$ 60

$y =$ 70

11.



$\frac{360}{6} = 60$

$x =$ 120

$y =$ 60

Look for a pattern and predict the next three numbers in each sequence.

12. 128, −64, 32, −16, 8, . . . _____
13. 1, $\frac{1}{2}$, 2, 1, 4, 2, 8, . . . _____

Accept the two statements as given information. State a conclusion based on deductive reasoning. If no conclusion can be reached, write *none*.

14. In $\triangle ABC$, $m\angle C = 90$.
In a triangle, there can be at most one right or obtuse angle.
_____

15. When there is a basketball game, the school parking lot is full.
The school parking lot is full tonight.
_____

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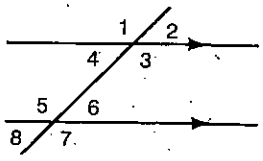
Practice 12
Chapter 3 Practice

Complete.

1. $\angle 4$ and $\angle 8$ are corresponding angles.
2. $\angle 4$ and $\angle 6$ are alternate interior angles.
3. $\angle 4$ and $\angle 5$ are same-side interior angles.



Exs. 1–6

Use the given information to find the value of x and the measure of each angle.

4. $m\angle 1 = 14x + 8; m\angle 5 = 17x - 19$

$14x + 8 = 17x - 19$
$27 = 3x$

$x =$ 9 $m\angle 1 =$ 134 $m\angle 5 =$ 134

5. $m\angle 3 = 9x + 2; m\angle 6 = 3x - 2$

$9x + 2 + 3x - 2 = 180$

$x =$ 15 $m\angle 3 =$ 137 $m\angle 6 =$ 43

6. $m\angle 4 = 45; m\angle 8 =$ 45 $m\angle 6 =$ 45 $m\angle 5 =$ 135

Complete each statement with the word *always*, *sometimes*, or *never*.

7. In a plane, two lines perpendicular to the same line are always parallel.
8. If two lines are cut by a transversal, corresponding angles are sometimes congruent.
9. A transversal perpendicular to one of two parallel lines is always perpendicular to the other line.
10. Two lines parallel to a third line are always parallel to each other.
11. An obtuse triangle is sometimes isosceles.

Tell whether the conclusion is based on inductive or deductive reasoning.

12. A 3-sided convex polygon has interior angle sum $(3 - 2)(180)$.
A 4-sided convex polygon has interior angle sum $(4 - 2)(180)$.
A 5-sided convex polygon has interior angle sum $(5 - 2)(180)$.
Then an n-sided convex polygon has interior angle sum $(n - 2)(180)$. _____
13. By drawing all diagonals from one vertex of an n-sided convex polygon, you can divide the polygon into $n - 2$ triangles. The interior angle sum of a triangle is 180. Then an n-sided convex polygon has interior angle sum $(n - 2)(180)$. _____

14. Find the measure of each exterior angle of a regular 15-sided polygon. 24
15. If $m\angle A = 3x + 3$, $m\angle B = 2x + 8$, and $m\angle C = 2x + 1$, find the numerical measure of each angle of $\triangle ABC$.

$m\angle A =$ 75 $m\angle B =$ 56 $m\angle C =$ 49

16. The measure of each angle of a regular polygon is 170. How many sides does the polygon have? 36