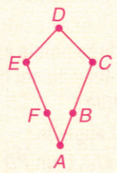
Lesson 2-7

9. Given: $\overline{AB} \cong \overline{AF}$, $\overline{AF} \cong \overline{ED}$, $\overline{ED} \cong \overline{CD}$
Prove: $\overline{AB} \cong \overline{CD}$

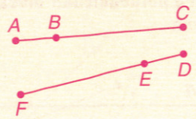


Proof:

Statements (Reasons)

1. $\overline{AB} \cong \overline{AF}$, $\overline{AF} \cong \overline{ED}$ (Given)
2. $\overline{AB} \cong \overline{ED}$ (Transitive)
3. $\overline{ED} \cong \overline{CD}$ (Given)
4. $\overline{AB} \cong \overline{CD}$ (Transitive)

10. Given: $AC = DF$, $AB = DE$
Prove: $BC = EF$



Proof:

Statements (Reasons)

1. $AC = AB + BC$ and $DF = DE + EF$ (Segment Addition Postulate)
2. $AC = DF$ (Given)
3. $AB + BC = DE + EF$ (Substitution)
4. $AB = DE$ (Given)
5. $BC = EF$ (Subtraction)

Extra Practice

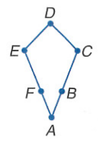
Lesson 2-7 (pages 101–106)

Justify each statement with a property of equality or a property of congruence.

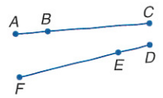
1. If $CD = OP$, then $CD + GH = OP + GH$. Addition
2. If $\overline{MN} \cong \overline{PQ}$, then $\overline{PQ} \cong \overline{MN}$. Symmetric
3. If $\overline{TU} \cong \overline{JK}$ and $\overline{JK} \cong \overline{DF}$, then $\overline{TU} \cong \overline{DF}$. Transitive
4. If $AB = 10$ and $CD = 10$, then $AB = CD$. Substitution
5. $\overline{XB} \cong \overline{XB}$ Reflexive
6. If $GH = RS$, then $GH - VW = RS - VW$. Subtraction
7. If $EF = XY$, then $EF + KL = XY + KL$. Addition
8. If $\overline{JK} \cong \overline{XY}$ and $\overline{XY} \cong \overline{LM}$, then $\overline{JK} \cong \overline{LM}$. Transitive

Write a two-column proof. 9–10. See margin.

9. Given: $\overline{AB} \cong \overline{AF}$, $\overline{AF} \cong \overline{ED}$, $\overline{ED} \cong \overline{CD}$
Prove: $\overline{AB} \cong \overline{CD}$



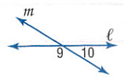
10. Given: $AC = DF$, $AB = DE$
Prove: $BC = EF$



Lesson 2-8 (pages 107–114)

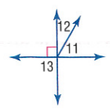
Find the measure of each numbered angle.

1. $m\angle 9 = 141 + x$
$m\angle 10 = 25 + x$



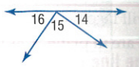
$m\angle 9 = 148$, $m\angle 10 = 32$

2. $m\angle 11 = x + 40$
$m\angle 12 = x + 10$
$m\angle 13 = 3x + 30$



$m\angle 11 = 60$, $m\angle 12 = 30$, $m\angle 13 = 90$

3. $m\angle 14 = x + 25$
$m\angle 15 = 4x + 50$
$m\angle 16 = x + 45$



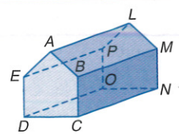
$m\angle 14 = 35$, $m\angle 15 = 90$, $m\angle 16 = 55$

Determine whether the following statements are *always*, *sometimes*, or *never* true.

4. Two angles that are complementary are congruent. sometimes
5. Two angles that form a linear pair are complementary. never
6. Two congruent angles are supplementary. sometimes
7. Perpendicular lines form four right angles. always
8. Two right angles are supplementary. always
9. Two lines intersect to form four right angles. sometimes

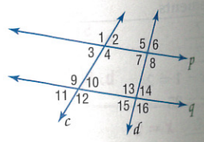
Lesson 3-1 (pages 126–131)

For Exercises 1–3, refer to the figure at the right.



1. Name all segments parallel to $\overline{AE}$. $\overline{LP}$
2. Name all planes intersecting plane BCN. ABM, OCN, ABC, LMN, AEP
3. Name all segments skew to $\overline{DC}$. $\overline{BM}$, $\overline{AL}$, $\overline{EP}$, $\overline{OP}$, $\overline{PL}$, $\overline{LM}$, $\overline{MN}$

Identify each pair of angles as *alternate interior*, *alternate exterior*, *corresponding*, or *consecutive interior* angles.

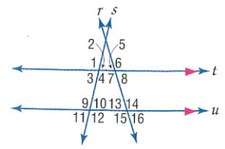


4. $\angle 2$ and $\angle 5$ cons. int.
5. $\angle 9$ and $\angle 13$ corresponding
6. $\angle 12$ and $\angle 13$ alt. int.
7. $\angle 3$ and $\angle 6$ alt. ext.

Lesson 3-2 (pages 133–138)

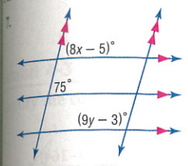
In the figure, $m\angle 5 = 72$ and $m\angle 9 = 102$. Find the measure of each angle.

1. $m\angle 1$ 102
2. $m\angle 13$ 72
3. $m\angle 4$ 102
4. $m\angle 10$ 78
5. $m\angle 7$ 108
6. $m\angle 16$ 72



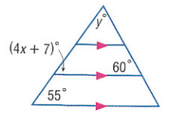
Find x and y in each figure.

7.



$x = 10$; $y = 12$

8.

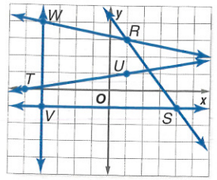


$x = 12$; $y = 65$

Lesson 3-3 (pages 139–144)

Find the slope of each line.

1. $\overline{RS}$ $-\frac{4}{3}$
2. $\overline{TU}$ $\frac{1}{6}$
3. $\overline{WV}$ undefined
4. $\overline{WR}$ $-\frac{1}{5}$
5. a line parallel to $\overline{TU}$ $\frac{1}{6}$
6. a line perpendicular to $\overline{WR}$ 5
7. a line perpendicular to $\overline{WV}$ 0



Determine whether $\overleftrightarrow{RS}$ and $\overleftrightarrow{TU}$ are *parallel*, *perpendicular*, or *neither*.

8. $R(3, 5)$, $S(5, 6)$, $T(-2, 0)$, $U(4, 3)$ parallel
9. $R(5, 11)$, $S(2, 2)$, $T(-1, 0)$, $U(2, 1)$ neither
10. $R(-1, 4)$, $S(-3, 7)$, $T(5, -1)$, $U(8, 1)$ perpendicular
11. $R(-2, 5)$, $S(-4, 1)$, $T(3, 3)$, $U(1, 5)$ neither

Lesson 3-4 (pages 145–150)

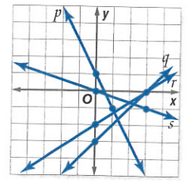
Write an equation in slope-intercept form of the line having the given slope and y-intercept.

1. $m = 1$, y-intercept: -5 $y = x - 5$
2. $m = -\frac{1}{2}$, y-intercept: $\frac{1}{2}$ $y = -\frac{1}{2}x + \frac{1}{2}$
3. $m = 3$, $b = -\frac{1}{4}$ $y = 3x - \frac{1}{4}$

Write an equation in point-slope form of the line having the given slope that contains the given point.

4. $m = 3$, $(-2, 4)$ $y - 4 = 3(x + 2)$
5. $m = -4$, $(0, 3)$ $y - 3 = -4x$
6. $m = \frac{2}{3}$, $(5, -7)$ $y + 7 = \frac{2}{3}(x - 5)$

For Exercises 7–14, use the graph at the right. Write an equation in slope-intercept form for each line.



7. p $y = -2x + 1$
8. q $y = x - 3$
9. r $y = \frac{2}{3}x - 2$
10. s $y = -\frac{1}{3}x$
11. parallel to line q, contains $(2, -5)$ $y = x - 7$
12. perpendicular to line r, contains $(0, 1)$ $y = -\frac{3}{2}x + 1$
13. parallel to line s, contains $(-2, -2)$ $y = -\frac{1}{3}x - \frac{8}{3}$
14. perpendicular to line p, contains $(0, 0)$ $y = \frac{1}{2}x$

Lesson 3-4

#13 $y + 2 = -\frac{1}{3}(x + 2)$

$y + 2 = -\frac{1}{3}x - \frac{2}{3}$

$-2 \quad\quad -2$

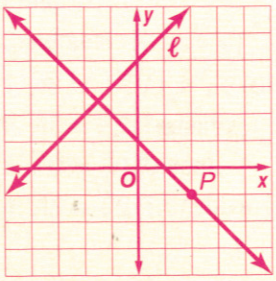
$y = -\frac{1}{3}x - \frac{8}{3}$

Lesson 3-5

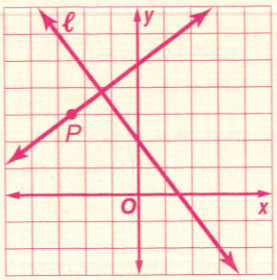
1. $c \parallel d$; ≅ alternate exterior ∡s
2. none
3. $c \parallel d$; ≅ alternate interior ∡s
4. $c \parallel d$; supplementary consecutive interior ∡s

Lesson 3-6

7. $d = \frac{7\sqrt{2}}{2}$;



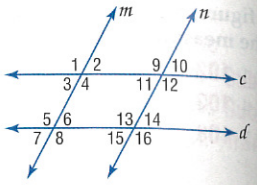
8. $d = 1.4$:



Extra Practice

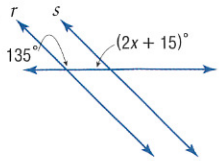
Lesson 3-5 (pages 151–157)

Given the following information, determine which lines, if any, are parallel. State the postulate or theorem that justifies your answer.

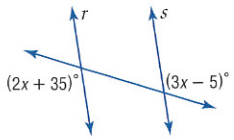


1. $\angle 9 \cong \angle 16$
2. $\angle 10 \cong \angle 16$
3. $\angle 12 \cong \angle 13$
4. $m\angle 12 + m\angle 14 = 180$ 1–4. See margin.

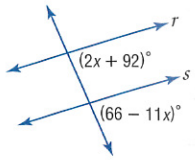
Find x so that $r \parallel s$.

5. 

15

6. 

40

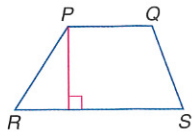
7. 

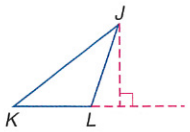
−2

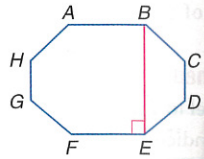
Lesson 3-6 (pages 159–164)

Copy each figure. Draw the segment that represents the distance indicated.

1. P to $\overleftrightarrow{RS}$
2. J to $\overleftrightarrow{KL}$
3. B to $\overleftrightarrow{FE}$







Find the distance between each pair of parallel lines.

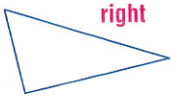
4. $y = \frac{2}{3}x - 2$ ≈ 2.08
   $y = \frac{2}{3}x + \frac{1}{2}$
5. $y = 2x + 4$ ≈ 4.02
   $y - 2x = -5$
6. $x + 4y = -6$ ≈ 2.43
   $x + 4y = 4$

COORDINATE GEOMETRY Construct a line perpendicular to ℓ through P. Then find the distance from P to ℓ. 7–8. See margin.

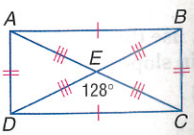
7. Line ℓ contains points (0, 4) and (−4, 0). Point P has coordinates (2, −1).
8. Line ℓ contains points (3, −2) and (0, 2). Point P has coordinates (−2.5, 3).

Lesson 4-1 (pages 178–183)

Use a protractor to classify each triangle as *acute*, *equiangular*, *obtuse*, or *right*.

1.  equiangular
2.  right
3.  obtuse

Identify the indicated type of triangles in the figure if $\overline{AB} \cong \overline{CD}$, $\overline{AD} \cong \overline{BC}$, $\overline{AE} \cong \overline{BE} \cong \overline{EC} \cong \overline{ED}$, and $m\angle BAD = m\angle ABC = m\angle BCD = m\angle ADC = 90$.

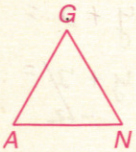


4. right △DAB, △ABC, △BCD, △ADC
5. obtuse △ABE, △CDE
6. acute △BEC, △AED
7. isosceles △ABE, △CDE, △BEC, △AED
8. Find a and the measure of each side of equilateral triangle MNO if $MN = 5a$, $NO = 4a + 6$, and $MO = 7a - 12$. $a = 6$; $MN = NO = MO = 30$
9. Triangle TAC is an isosceles triangle with $\overline{TA} \cong \overline{AC}$. Find b, TA, AC, and TC if $TA = 3b + 1$, $AC = 4b - 11$, and $TC = 6b - 2$. $b = 12$; $TA = AC = 37$, $TC = 70$

Lesson 4-3

5. Given: $\triangle ANG \cong \triangle NGA$, $\triangle NGA \cong \triangle GAN$

   Prove: $\triangle AGN$ is equilateral and equiangular.



Proof: Statements (Reasons)

1. $\triangle ANG \cong \triangle NGA$ (Given)
2. $\overline{AN} \cong \overline{NG}$, $\angle A \cong \angle N$ (CPCTC)
3. $\triangle NGA \cong \triangle GAN$ (Given)
4. $\overline{NG} \cong \overline{GA}$, $\angle N \cong \angle G$ (CPCTC)
5. $\overline{AN} \cong \overline{NG} \cong \overline{GA}$ (Transitive Property of ≅)
6. $\triangle AGN$ is equilateral. (Def. of equilateral △)
7. $\angle A \cong \angle N \cong \angle G$ (Transitive Property of ≅)
8. $\triangle AGN$ is equiangular. (Def. of equiangular △)