

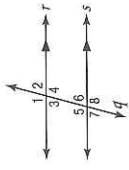
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3-2 Skills Practice

Angles and Parallel Lines

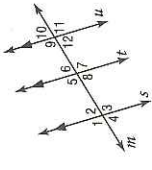
In the figure, $m\angle 2 = 70$. Find the measure of each angle.

- 1. $\angle 3$ **70**
- 2. $\angle 5$ **110**
- 3. $\angle 8$ **110**
- 4. $\angle 1$ **110**
- 5. $\angle 4$ **110**
- 6. $\angle 6$ **70**



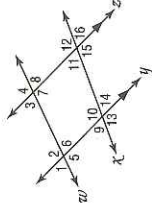
In the figure, $m\angle 7 = 100$. Find the measure of each angle.

- 7. $\angle 9$ **100**
- 8. $\angle 6$ **80**
- 9. $\angle 8$ **80**
- 10. $\angle 2$ **80**
- 11. $\angle 5$ **100**
- 12. $\angle 11$ **100**

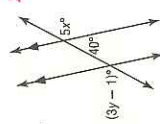


In the figure, $m\angle 3 = 75$ and $m\angle 10 = 115$. Find the measure of each angle.

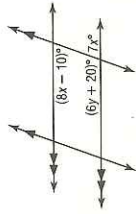
- 13. $\angle 2$ **105**
- 14. $\angle 5$ **105**
- 15. $\angle 7$ **105**
- 16. $\angle 15$ **115**
- 17. $\angle 14$ **65**
- 18. $\angle 9$ **65**



Find x and y in each figure.

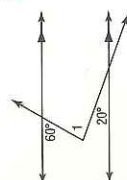


- 19. $x = 28, y = 47$

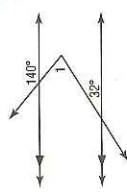


- 20. $x = 10, y = 15$

Find $m\angle 1$ in each figure.



- 21. **80**



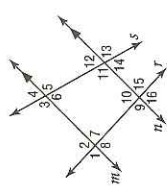
- 22. **72**

3-2 Practice (Average)

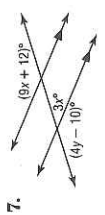
Angles and Parallel Lines

In the figure, $m\angle 2 = 92$ and $m\angle 12 = 74$. Find the measure of each angle.

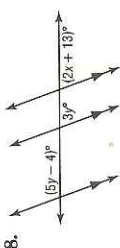
- 1. $\angle 10$ **92**
- 2. $\angle 8$ **92**
- 3. $\angle 9$ **88**
- 4. $\angle 5$ **106**
- 5. $\angle 11$ **106**
- 6. $\angle 13$ **106**



Find x and y in each figure.

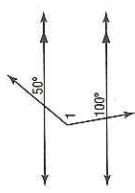


- 7. $x = 14, y = 37$

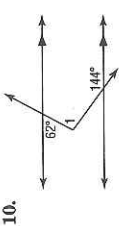


- 8. $x = 28, y = 23$

Find $m\angle 1$ in each figure.



- 9. **130**



- 10. **98**

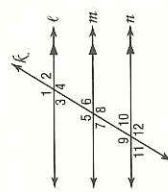
11. **PROOF** Write a paragraph proof of Theorem 3.3.

Given: $\ell \parallel m, m \parallel n$

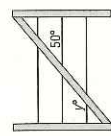
Prove: $\angle 1 \cong \angle 12$

Sample proof:

It is given that $\ell \parallel m$, so $\angle 1 \cong \angle 8$ by the Alternate Exterior Angles Theorem. Since it is given that $m \parallel n$, $\angle 8 \cong \angle 12$ by the Corresponding Angles Postulate. Therefore, $\angle 1 \cong \angle 12$, since congruence of angles is transitive.



12. **FENCING** A diagonal brace strengthens the wire fence and prevents it from sagging. The brace makes a 50° angle with the wire as shown. Find y . **130**



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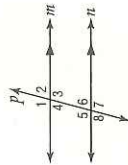
3-2 Study Guide and Intervention Angles and Parallel Lines

Parallel Lines and Angle Pairs When two parallel lines are cut by a transversal, the following pairs of angles are congruent.

- corresponding angles
 - alternate interior angles
 - alternate exterior angles
- Also, consecutive interior angles are supplementary.

Example In the figure, $m\angle 2 = 75$. Find the measures of the remaining angles.

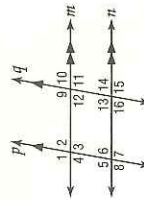
- $m\angle 1 = 105$ $\angle 1$ and $\angle 2$ form a linear pair.
 $m\angle 3 = 105$ $\angle 3$ and $\angle 2$ form a linear pair.
 $m\angle 4 = 75$ $\angle 4$ and $\angle 2$ are vertical angles.
 $m\angle 5 = 105$ $\angle 5$ and $\angle 3$ are alternate interior angles.
 $m\angle 6 = 75$ $\angle 6$ and $\angle 2$ are corresponding angles.
 $m\angle 7 = 105$ $\angle 7$ and $\angle 3$ are corresponding angles.
 $m\angle 8 = 75$ $\angle 8$ and $\angle 6$ are vertical angles.



Exercises

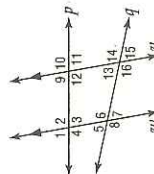
In the figure, $m\angle 3 = 102$. Find the measure of each angle.

- $\angle 5$ **102**
- $\angle 6$ **78**
- $\angle 7$ **102**
- $\angle 8$ **78**
- $\angle 15$ **102**
- $\angle 14$ **78**



In the figure, $m\angle 9 = 80$ and $m\angle 5 = 68$. Find the measure of each angle.

- $\angle 12$ **100**
- $\angle 4$ **100**
- $\angle 7$ **68**
- $\angle 1$ **80**
- $\angle 3$ **80**
- $\angle 16$ **112**
- $\angle 11$ **68**



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3-2 Study Guide and Intervention Angles and Parallel Lines

Algebra and Angle Measures Algebra can be used to find unknown values in angles formed by a transversal and parallel lines.

Example If $m\angle 1 = 3x + 15$, $m\angle 2 = 4x - 5$, $m\angle 3 = 5y$, and $m\angle 4 = 6z + 3$, find x and y .

$p \parallel q$, so $m\angle 1 = m\angle 2$ because they are corresponding angles.

$$3x + 15 = 4x - 5 - 3x$$

$$15 = x - 5$$

$$15 + 5 = x - 5 + 5$$

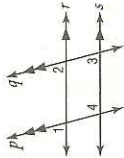
$$20 = x$$

$r \parallel s$, so $m\angle 2 = m\angle 3$

$$5y = 5y$$

$$\frac{75}{5} = \frac{5y}{5}$$

$$15 = y$$



Exercises

Find x and y in each figure.

- $x = 15$; $y = 19$
- $x = 6$; $y = 24$
- $x = 11$; $y = 10$
- $x = 10$; $y = 25$
- $x = 74$; $y = 37$; $z = 25$
- $x = 30$; $y = 15$; $z = 150$

Find x , y , and z in each figure.