Lesson: Angles

Title: Angles

Objectives: Students will be able to use rules for Angles Formed When A Transverse Cuts Two Parallel Lines to solve problems.

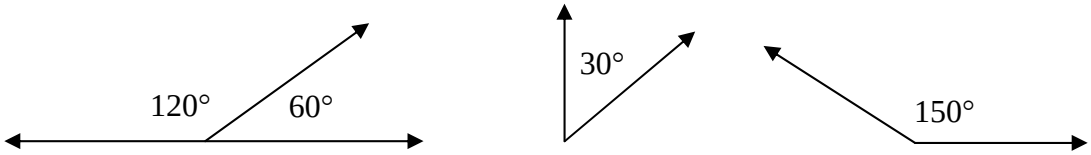
Materials:
Teacher notes and script (*This page and next*)
Student worksheet (*1 per student*)
Overheads (*Make transparencies*)

Previous Knowledge Needed:
Parallel lines; nomenclature for triangles and angles

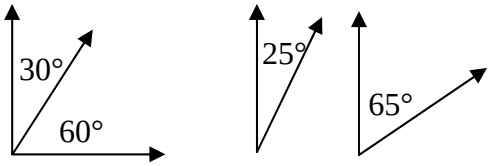
Important Vocabulary:
Supplementary Angles
Complementary Angles
Vertical/Opposite Angles
Interior Angles
Alternate Interior Angles
Exterior Angles
Alternate Exterior Angles
Corresponding Angles
Adjacent Angles

Script:
Today we're going to work on geometry angles. (*Put problem up on overhead and read. Students should fill in their worksheet as you fill in the overhead.*)

Supplementary Angles: angles that add to 180°

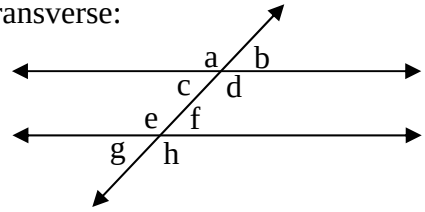


Complementary Angles: angles that add to 90°



What is the complement of a 35° angle?
What is the supplement of a 110°?

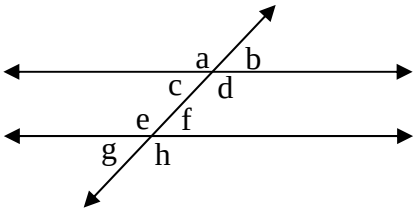
Parallel Lines Cut by a Transverse:



List the angles that are:
Vertical/Opposite Angles a&d, c&b, e&h, g&f
Interior Angles c, d, e, f
Alternate Interior Angles c&f, e&d
Exterior Angles a, b, g, h
Alternate Exterior Angles a&h, b&g
Corresponding Angles b&f, d&h, a&e, c&g
Adjacent Angles a&b, b&d, d&c, c&a, e&f, f&h, h&g, g&e

Lesson: Angles

Many angles in this situation are equal:



Vertical angles are equal, so:
a = d, c = b, e = h, g = f

Corresponding angles are equal, so:
b = f, d = h, a = e, c = g

Alternate Exterior angles are equal, so:
a = h, b = g

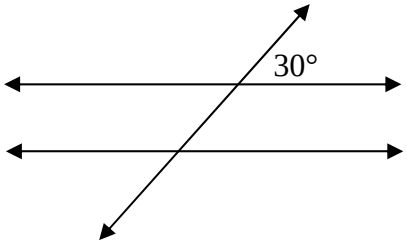
Alternate Interior angles are equal, so:
c = f, d = e

Adjacent angles form Supplementary angles, so:
a + b = 180°, b + d = 180°, d + c = 180°, c + a = 180°, e + f = 180°, f + h = 180°, h +g = 180°, g + e = 180°

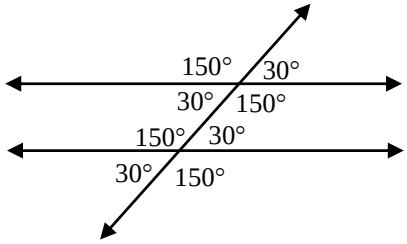
Interior angles on the same side form supplementary angles, so:
d + f = 180°, c + e = 180°

Exterior angles on the same side form supplementary angles, so:
a + g = 180°, b + h = 180°

Because of these relationships, we can determine the measure of all of the angles when given only one:



Use the angle relationships to figure all of the angle measures.



Now students complete the worksheet individually.

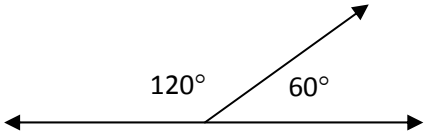
Script

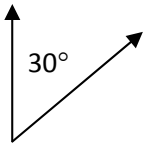
Lesson: Angles

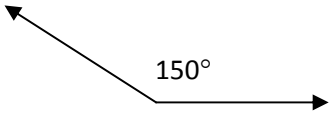
Script

Lesson: Angles

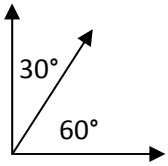
Supplementary Angles:

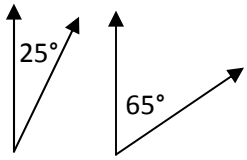






Complementary Angles:

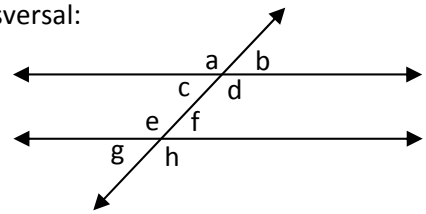




What is the complement of a 35° angle?_____

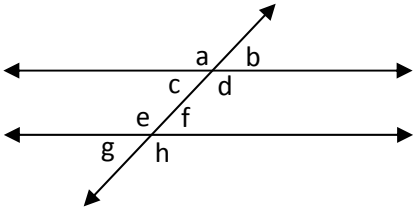
What is the supplement of a 110°? _____

Parallel Lines Cut by a Transversal:



List the angles that are:
Vertical/Opposite Angles
Interior Angles
Alternate Interior Angles
Exterior Angles
Alternate Exterior Angles
Corresponding Angles
Adjacent Angles

Many angles in this situation are equal:



Vertical angles are equal, so:

Corresponding angles are equal, so:

Alternate Exterior angles are equal, so:

Alternate Interior angles are equal, so:

Adjacent angles form Supplementary angles, so:

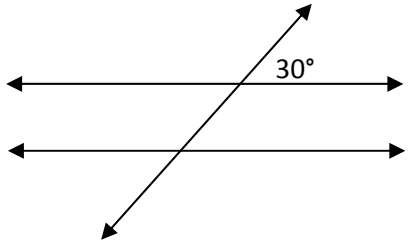
Interior angles on the same side form supplementary angles, so:

Exterior angles on the same side form supplementary angles, so:

Transparency

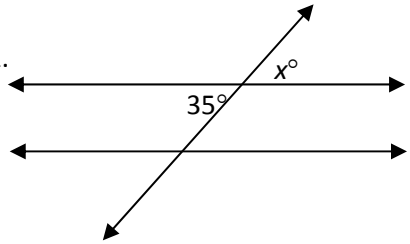
Lesson: Angles

Because of these relationships, we can determine the measure of all of the angles when given only one:

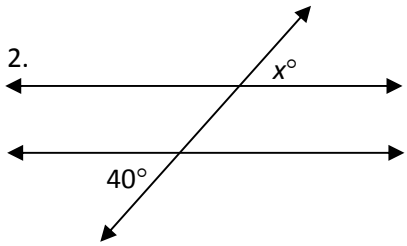


Use what you've learned to fill in all of the missing angles labeled *x*:

1.



2.



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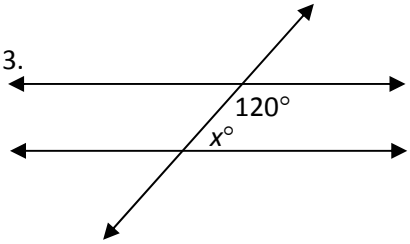

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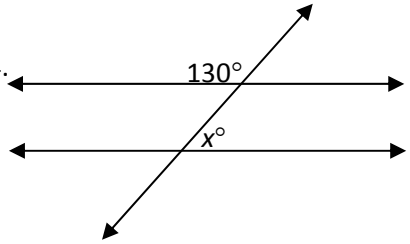

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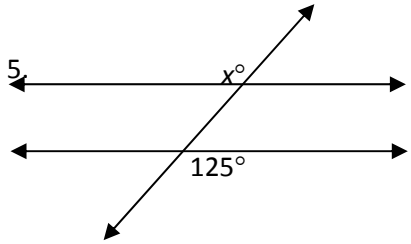

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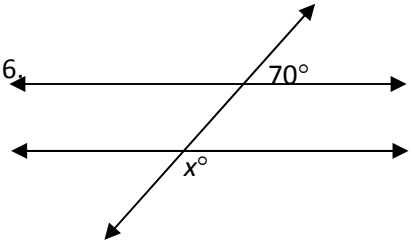
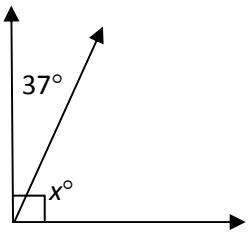


7. What is the complement of a 38° angle? _____

8. What is the supplement of a 123° angle? _____

Find the measure of angle *x*:

9.



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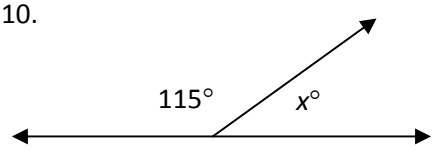
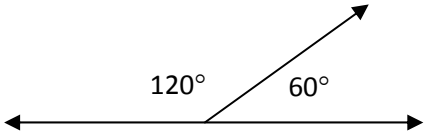
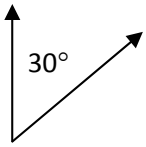
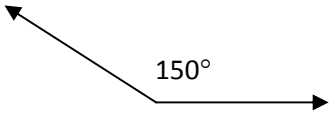


Lesson: Angles Name: _____

Supplementary Angles:







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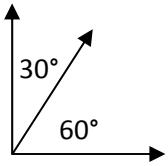

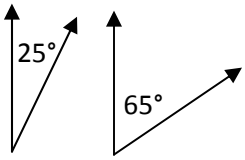

What is the complement of a 35° angle?_____

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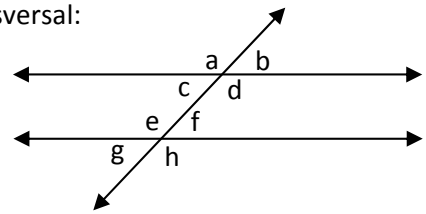
Parallel Lines Cut by a Transversal:



List the angles that are:
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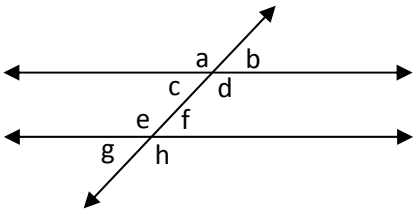
Many angles in this situation are equal:



Vertical angles are equal, so:

Corresponding angles are equal, so:

Alternate Exterior angles are equal, so:

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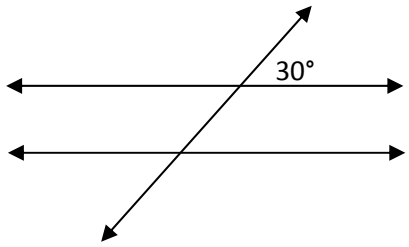
Interior angles on the same side form supplementary angles, so:

Exterior angles on the same side form supplementary angles, so:

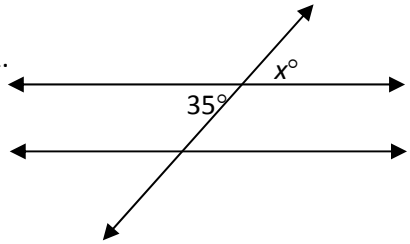
Lesson: Angles Name: _____

Because of these relationships, we can determine the measure of all of the angles when given only one:



Use what you've learned to fill in all of the missing angles labeled *x*:

1.



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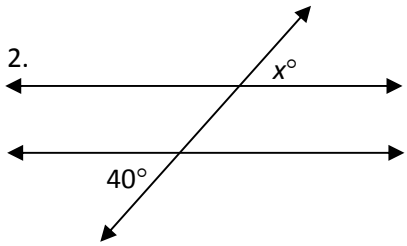

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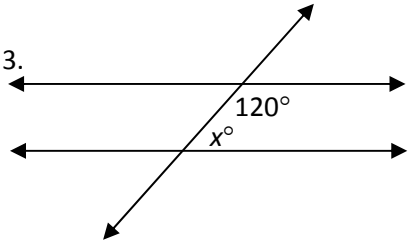

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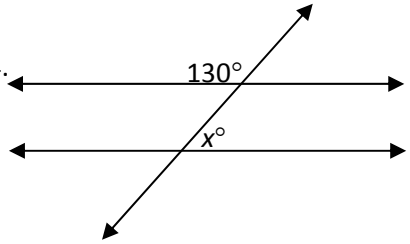

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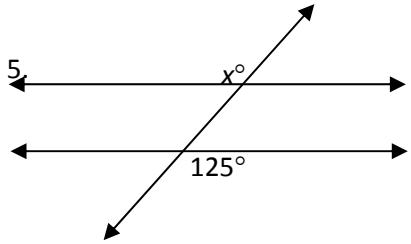

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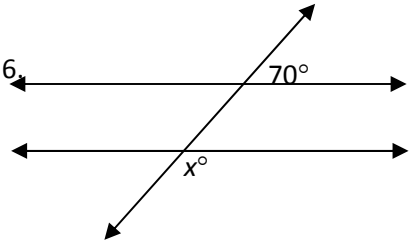
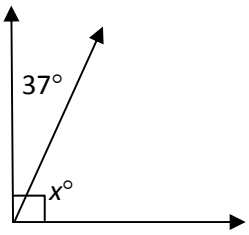


7. What is the complement of a 38° angle? _____

8. What is the supplement of a 123° angle? _____

Find the measure of angle *x*:

9.



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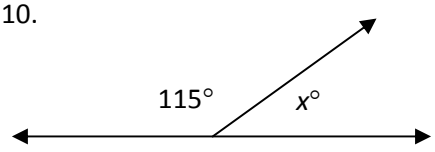
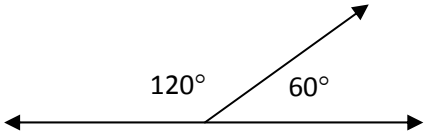
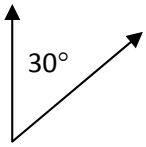
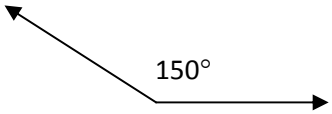


Lesson: Angles

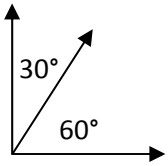
Supplementary Angles: angles that add to 180°

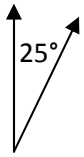


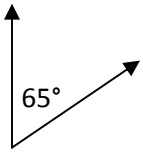




Complementary Angles: Angles that add to 90°



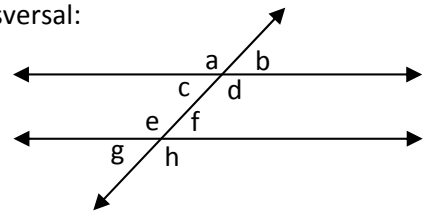




What is the complement of a 35° angle? 55° 90 - 35 = 55

What is the supplement of a 110°? 70° 180 - 110 = 70

Parallel Lines Cut by a Transversal:



List the angles that are:

Vertical/Opposite Angles a ∠ d, b ∠ c, e ∠ h, f ∠ g

Interior Angles c, d, e, f

Alternate Interior Angles c ∠ f, e ∠ d

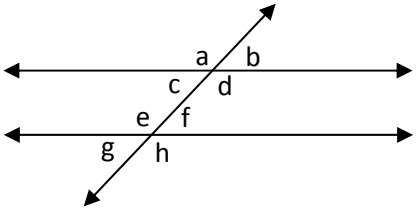
Exterior Angles a, b, g, h

Alternate Exterior Angles a ∠ h, b ∠ g

Corresponding Angles a ∠ e, b ∠ f, c ∠ g, d ∠ h

Adjacent Angles a ∠ b, b ∠ d, d ∠ c, c ∠ a, e ∠ f, f ∠ h, h ∠ g, e ∠ g

Many angles in this situation are equal:



Vertical angles are equal, so: a = d b = c e = h g = f

Corresponding angles are equal, so: a = e b = f c = g d = h

Alternate Exterior angles are equal, so: a = h b = g

Alternate Interior angles are equal, so: c = f e = d

Adjacent angles form Supplementary angles, so:
a + b = 180 b + d = 180 d + c = 180 c + a = 180
e + f = 180 f + h = 180 h + g = 180 g + e = 180

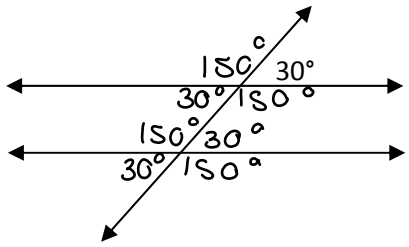
Interior angles on the same side form supplementary angles, so: c + e = 180 d + f = 180

Exterior angles on the same side form supplementary angles, so: a + g = 180 b + h = 180

Answer Key

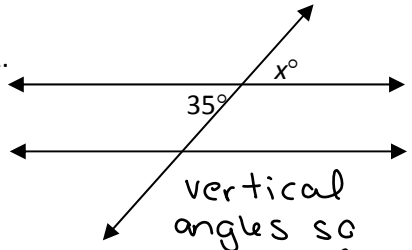
Lesson: Angles

Because of these relationships, we can determine the measure of all of the angles when given only one:



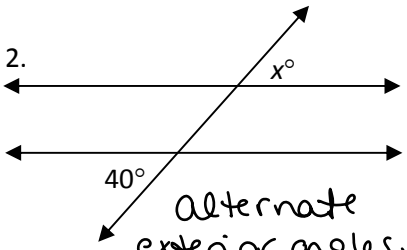
Use what you've learned to fill in all of the missing angles labeled *x*:

1.



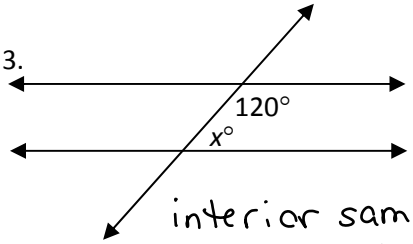
vertical angles so $x = 35°$

2.



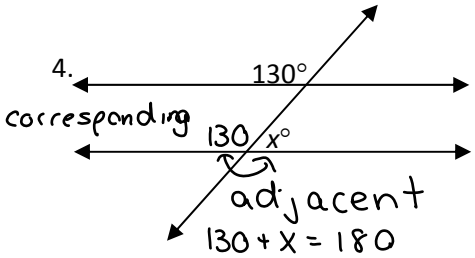
alternate exterior angles, so $x = 40°$

3.



interior same side, so $x + 120 = 180$, so $x = 60°$

4.

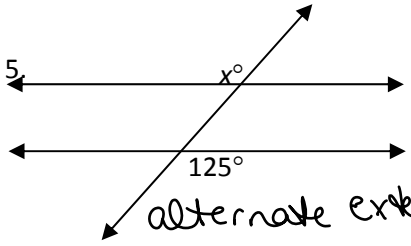


adjacent

$130 + x = 180$

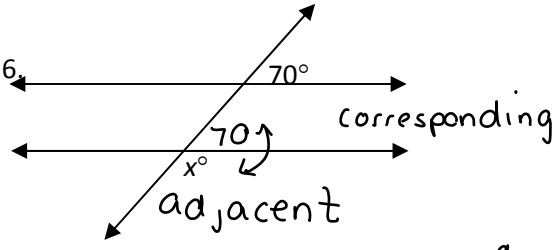
$x = 50°$

5.



alternate exterior angles $x = 125$

6.



adjacent

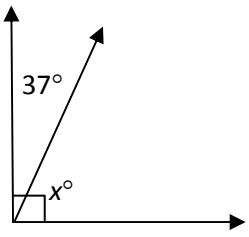
$x + 70 = 180$ $x = 110°$

7. What is the complement of a 38° angle? 52° $x + 38 = 90$

8. What is the supplement of a 123° angle? 57° $x + 123 = 180$

Find the measure of angle *x*:

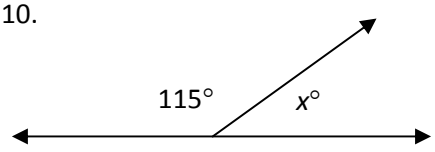
9.



$x + 37 = 90$

$x = 53$

10.



$115 + x = 180$

$x = 65$

Answer Key