Day 18 Notes

Schedule:
- get a calculator and sign in

- do now

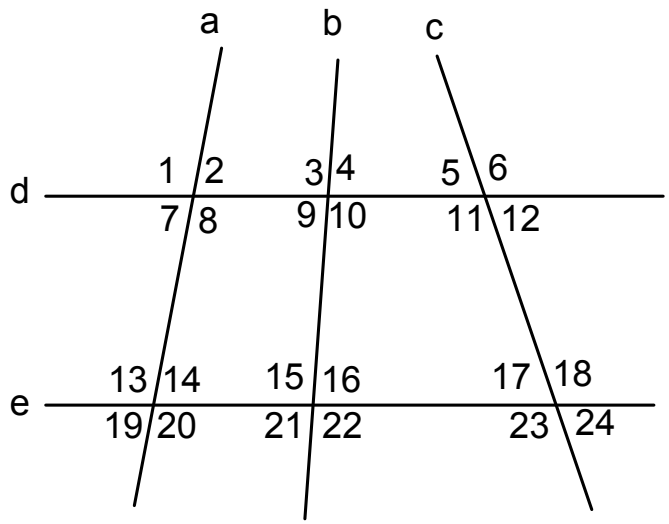
- notes

- tod

- hw

Sep 5-5:17 PM

Do Now:



Sep 18-12:13 PM

Day 18 Notes

Sep 22-11:07 AM

Proving Lines Parallel

Objective To determine whether two lines are parallel

Essential Understanding You can use certain angle pairs to decide whether two lines are parallel.

Sep 12-11:52 AM

Postulate: If at least one of following is true:
- Corresponding Angles are congruent
- Alternate Interior Angles are congruent
- Alternate Exterior Angles are congruent
- Same-side Interior Angles are supplementary

Then you have parallel lines.

Sep 12-11:54 AM

VERTICAL ANGLES

AND

LINEAR PAIRS

DO NOT PROVE

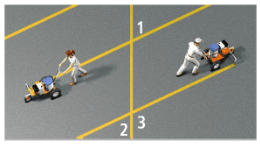
IF TWO LINES ARE PARALLEL!

Sep 6-1:34 PM

Day 18 Notes

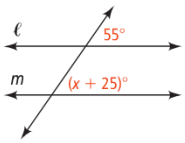
Homework

12. Parking Two workers paint lines for angled parking spaces. One worker paints a line so that $m\angle 1 = 65$. The other worker paints a line so that $m\angle 2 = 65$. Are their lines parallel? Explain.



Algebra Find the value of x for which $\ell \parallel m$.

13.



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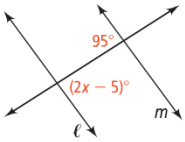

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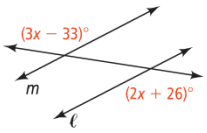

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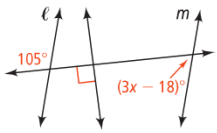
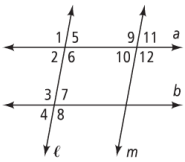


Developing Proof Use the given information to determine which lines, if any, are parallel. Justify each conclusion with a theorem or postulate.



17. $\angle 2$ is supplementary to $\angle 3$.

18. $\angle 1 \cong \angle 3$

19. $\angle 6$ is supplementary to $\angle 7$.

20. $\angle 9 \cong \angle 12$

21. $m\angle 7 = 65$, $m\angle 9 = 115$

22. $\angle 2 \cong \angle 10$

23. $\angle 1 \cong \angle 8$

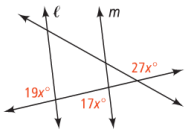
24. $\angle 8 \cong \angle 6$

25. $\angle 11 \cong \angle 7$

26. $\angle 5 \cong \angle 10$

Algebra Find the value of x for which $\ell \parallel m$.

27.



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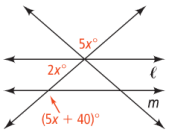


Sep 12-12:01 PM

Homework

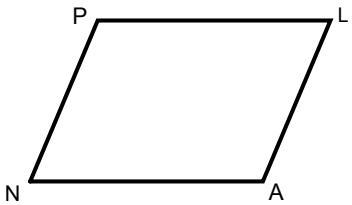
Which sides of quadrilateral *PLAN* must be parallel? Explain.

42. $m\angle P = 72$, $m\angle L = 108$, $m\angle A = 72$, $m\angle N = 108$

43. $m\angle P = 59$, $m\angle L = 37$, $m\angle A = 143$, $m\angle N = 121$

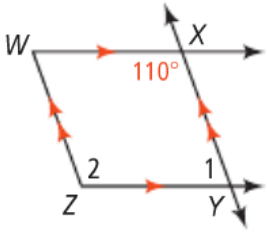
44. $m\angle P = 67$, $m\angle L = 120$, $m\angle A = 73$, $m\angle N = 100$

45. $m\angle P = 56$, $m\angle L = 124$, $m\angle A = 124$, $m\angle N = 56$



Find $m\angle 1$ and $m\angle 2$. Justify each answer.

52.



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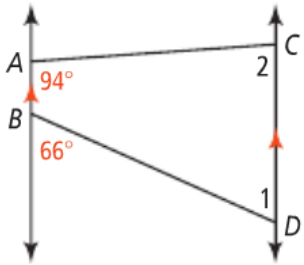


Sep 6-1:56 PM

Day 18 Notes

12. Yes; $\angle 1$ and $\angle 2$ are alt. ext. $\angle$s, and if alt. ext. $\angle$s are $\cong$, then the lines are $\parallel$.

13. 30 **14.** 50

15. 59 **16.** 31

17. $a \parallel b$; if same-side int. $\angle$s are suppl., then the lines are $\parallel$.

18. $a \parallel b$; Converse of Corresp. $\angle$s Post.

19. $a \parallel b$; if same-side int. $\angle$s are suppl., then the lines are $\parallel$.

20. none

21. none

22. $\ell \parallel m$ (Conv. of Corresp. $\angle$s Post.)

23. $a \parallel b$ (Conv. of the Alt. Ext. $\angle$s Thm.)

24. $a \parallel b$ (Conv. of Corresp. $\angle$s Post)

25. none

26. $\ell \parallel m$ (Conv. of the Alt. Int. $\angle$s Thm.)

27. 5 **28.** 20

42. $\overline{PL} \parallel \overline{NA}$; $\overline{PN} \parallel \overline{LA}$; if same-side int. $\angle$s are suppl., then the lines are $\parallel$.

43. $\overline{PL} \parallel \overline{NA}$; if same-side int. $\angle$s are suppl., then the lines are $\parallel$.

44. none

45. $\overline{PN} \parallel \overline{LA}$; if same-side int. $\angle$s are suppl., then the lines are $\parallel$.

52. $m\angle 1 = 70$ ($\angle 1$ is suppl. to a $110° \angle$.); $m\angle 2 = 110$ ($\angle 2$ is suppl. to $\angle 1$, which is a $70°$ angle.)

53. $m\angle 1 = 66$ (Alt. int. $\angle$s are $\cong$.); $m\angle 2 = 86$ ($\angle 2$ is suppl. to a $94°$ angle.)

Sep 16-11:16 AM

Choose the word from the list below that best matches each sentence.

intersect **parallel** **perpendicular** **transversal**

1. two lines in the same plane that never intersect _____
2. a line that crosses two lines in the same plane at two different points _____
3. what two lines do that cross at a point _____
4. two lines that cross at a 90° angle _____

Use a word from the list above to complete each sentence.

5. The symbol $\perp$ is used to show that lines are _____.
6. If two lines are parallel to the same line, they are _____ to each other.
7. The symbol $\parallel$ is used to show that lines are _____.
8. Parallel lines are lines that never _____ .

12. What type of angle is formed by the intersection of two perpendicular lines?

(A) acute (B) obtuse (C) right (D) straight

13. If lines a and b are perpendicular to line c, what word best describes how lines a and b relate to each other?

(F) intersecting (G) parallel (H) perpendicular (I) skew

Sep 21-12:30 PM

Day 18 Notes

Objectives To use parallel lines to prove a theorem about triangles
To find measures of angles of triangles

Essential Understanding The sum of the angle measures of a triangle is always the same.

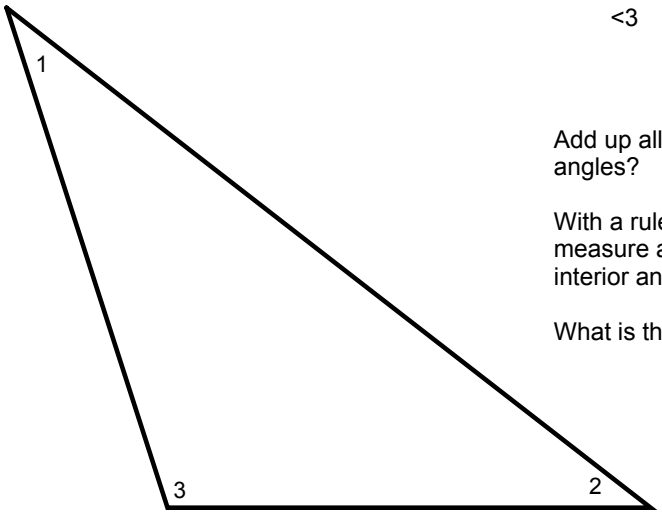
Sep 21-12:34 PM

Activity

Use a protractor to measure:
<1

<2

<3



Add up all three angles. What is the sum of all three angles?

With a ruler, construct another triangle and then measure all of the interior angles. Add up all of the interior angles. What is the sum of all of those angles?

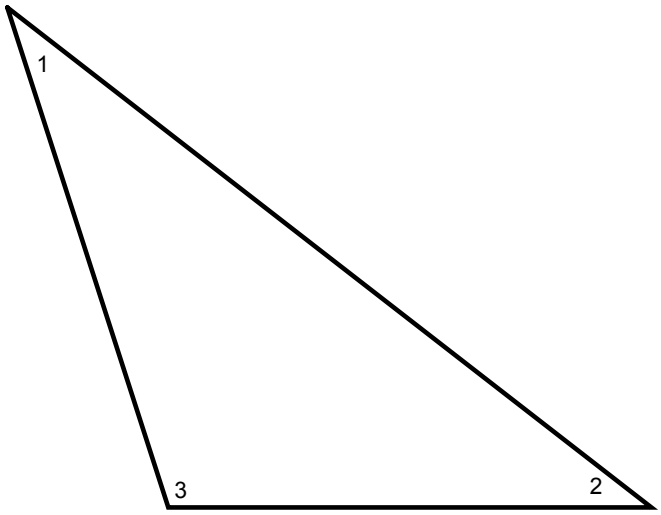
What is the sum of all the interior angles of any triangle?

Sep 21-12:38 PM

Day 18 Notes

Activity

Without using a protractor, what is the sum of <1 + <2 + <3?
Explain or show your reasoning.



Sep 21-12:38 PM

Activity

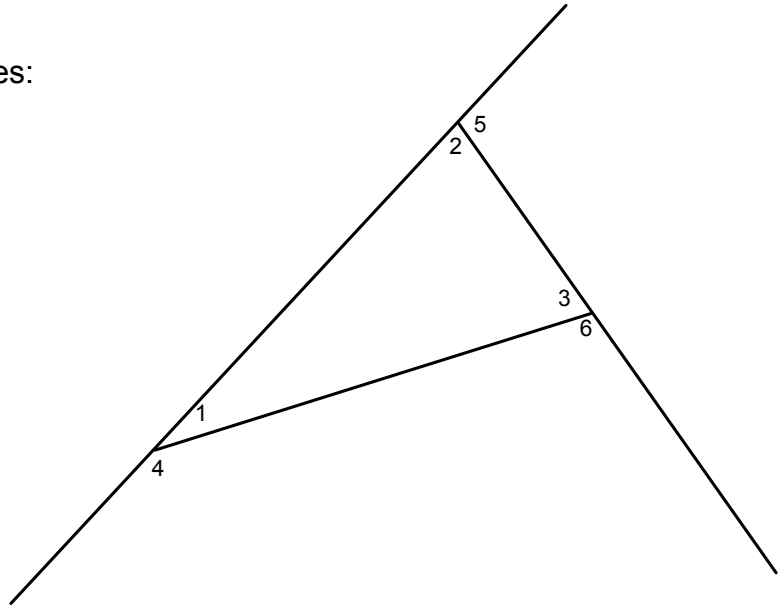
Find all the angle measures:

<1	<4
<2	<5
<3	<6

What is the relation between angles 1, 3, and 5?

What is the relation between angles 2, 3, and 4?

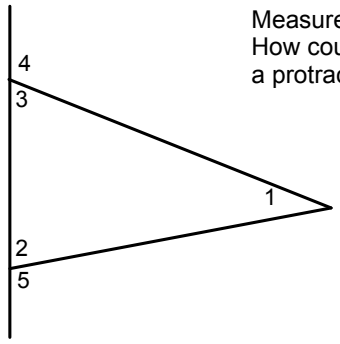
What is the relation between angles 1, 2, and 6?



Sep 21-12:45 PM

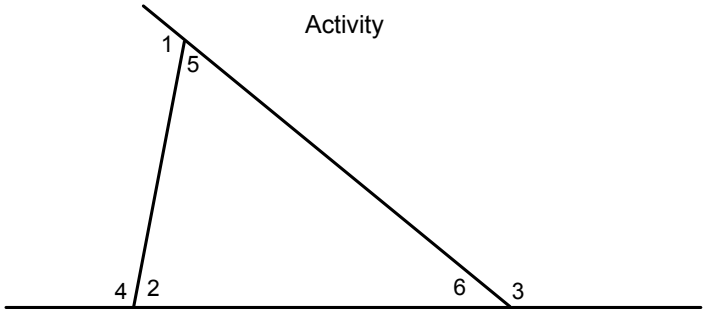
Day 18 Notes

Activity



Measure angles 1, 2 with a protractor.
How could you find angles 3, 4, 5 without a protractor? Explain.

Activity

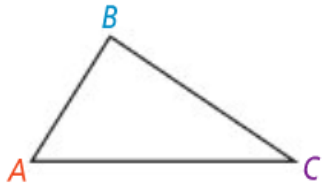


Measure angles 1, 2, and 3 with a protractor.
Find two different ways to find the measures of angles 4, 5, and 6 without using a protractor.

Sep 10-1:56 PM

Triangle Angle-Sum Theorem

The sum of the measures of the angles of a triangle is 180.

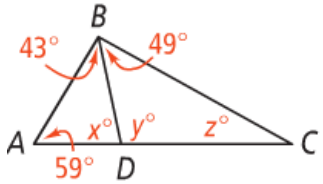


$$m\angle A + m\angle B + m\angle C = 180$$

Sep 21-12:43 PM

Day 18 Notes

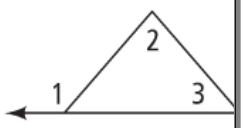
What are the values of x and y in the diagram at the right?



Sep 21-12:43 PM

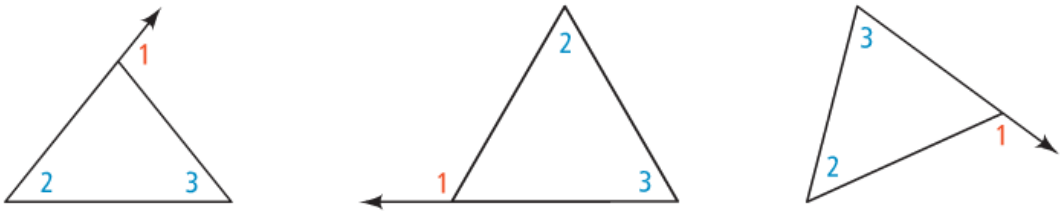
Triangle Exterior Angle Theorem

The measure of each exterior angle of a triangle equals the sum of the measures of its two remote interior angles.



$$m\angle 1 = m\angle 2 + m\angle 3$$

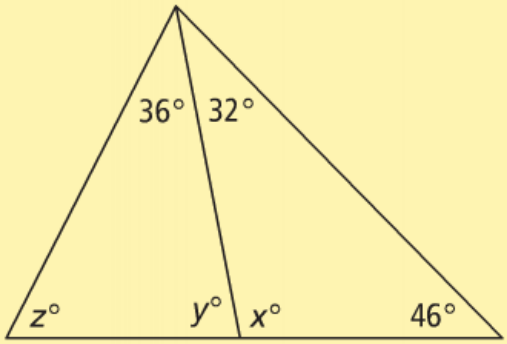
An **exterior angle of a polygon** is an angle formed by a side and an extension of an adjacent side. For each exterior angle of a triangle, the two nonadjacent interior angles are its **remote interior angles.** In each triangle below, $\angle 1$ is an exterior angle and $\angle 2$ and $\angle 3$ are its remote interior angles.



Sep 21-12:49 PM

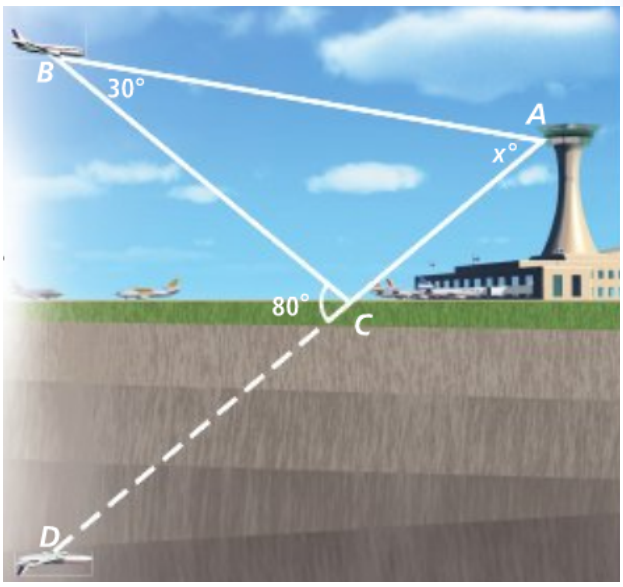
Day 18 Notes

Solve for x, y, and z in the figure below.



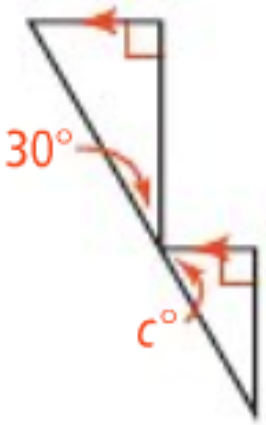
Sep 21-12:50 PM

When radar tracks an object, the reflection of signals off the ground can result in clutter. Clutter causes the receiver to confuse the real object with its reflection, called a ghost. At the right, there is a radar receiver at A, an airplane at B, and the airplane's ghost at D. What is the value of x?



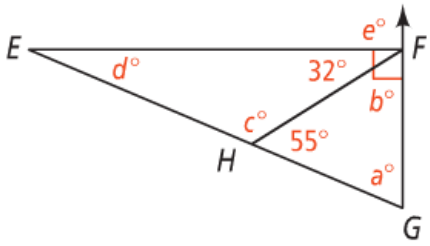
Sep 21-12:52 PM

Solve for the missing variable:



Sep 21-1:07 PM

Solve for the missing variable:



Sep 21-1:10 PM

Day 18 Notes

Find the measure of the third angle of a triangle given the measures of two angles.

1. 34 and 88 **2.** 45 and 90

3. 10 and 102 **4.** x and 50

In a triangle, $\angle 1$ is an exterior angle and $\angle 2$ and $\angle 3$ are its remote interior angles. Find the missing angle measure.

5. $m\angle 2 = 24$ and $m\angle 3 = 106$

6. $m\angle 1 = 70$ and $m\angle 2 = 32$

8. Error Analysis The measures of the interior angles of a triangle are 30, x, and $3x$. Which of the following methods for solving for x is incorrect? Explain.

A.

$$\begin{aligned} x + 3x &= 30 \\ 4x &= 30 \\ x &= 7.5 \end{aligned}$$

B.

$$\begin{aligned} x + 3x + 30 &= 180 \\ 4x + 30 &= 180 \\ 4x &= 150 \\ x &= 37.5 \end{aligned}$$

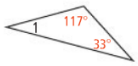
TOD
hand in

Sep 10-1:52 PM

homework

Find $m\angle 1$. See Problem

9.



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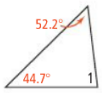
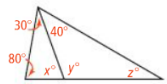


11.

Algebra Find the value of each variable.

12.



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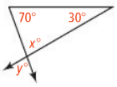

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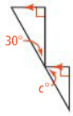
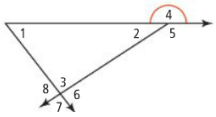


Use the diagram at the right for Exercises 15 and 16. See Problem

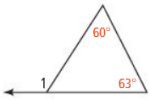
15. a. Which of the numbered angles are exterior angles?
b. Name the remote interior angles for each exterior angle.
c. How are exterior angles 6 and 8 related?

16. a. How many exterior angles are at each vertex of the triangle?
b. How many exterior angles does a triangle have in all?



Algebra Find each missing angle measure.

17.



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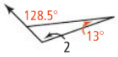

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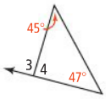
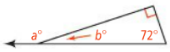


20. A ramp forms the angles shown at the right. What are the values of a and b?



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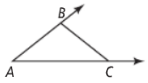
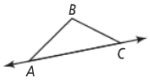
28. Draw a Diagram Which diagram below correctly represents the following description? Explain your reasoning.

Draw any triangle. Label it $\triangle ABC$. Extend two sides of the triangle to form two exterior angles at vertex A.

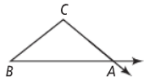
I.



II.



III.



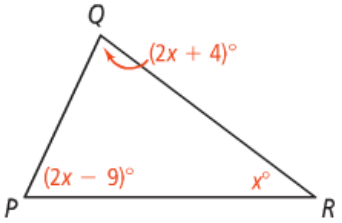
Sep 11-6:51 AM

Day 18 Notes

homework

Find the values of the variables and the measures of the angles.

29.



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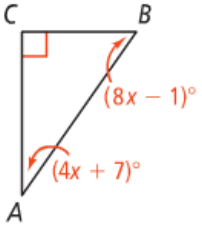

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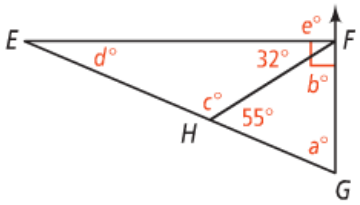
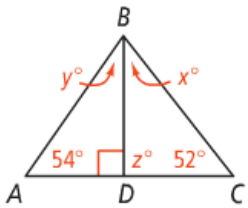
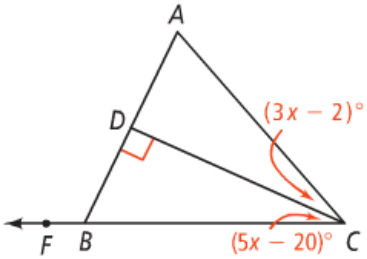


32.



41. In the figure at the right, $\overline{CD} \perp \overline{AB}$ and $\overline{CD}$ bisects $\angle ACB$. Find $m\angle DBF$.

42. If the remote interior angles of an exterior angle of a triangle are congruent, what can you conclude about the bisector of the exterior angle? Justify your answer.



Sep 11-6:55 AM

9. 30 **10.** 83.1 **11.** 90

12. $x = 70$, $y = 110$, $z = 30$

13. $x = y = 80$ **14.** $c = 60$

15a. $\angle 5$, $\angle 6$, $\angle 8$

b. For $\angle 5$: $\angle 1$ and $\angle 3$; for $\angle 6$: $\angle 1$ and $\angle 2$; for $\angle 8$: $\angle 1$ and $\angle 2$

c. $\angle 6 \cong \angle 8$

16a. 2 **b.** 6

17. 123 **18.** 115.5

19. $m\angle 3 = 92$, $m\angle 4 = 88$

20. $a = 162$, $b = 18$

28. III; I does not have any ext. ∡s at A. II has only one ext. ∠ at A and only one side of the △ extended.

29. $x = 37$; $m\angle P = 65$, $m\angle Q = 78$, $m\angle R = 37$

30. $x = 7$; $m\angle A = 35$, $m\angle B = 55$, $m\angle C = 90$

31. $a = 67$, $b = 58$, $c = 125$, $d = 23$, $e = 90$

32. $x = 38$; $y = 36$, $z = 90$; $m\angle ABC = 74$

41. 115

42. The bisector is ∥ to the side common to the ≅ ∡s. If the measure of each ≅ ∠ is x, then the measure of the ext. ∠ is $2x$ so the bisector forms 2 ∡s of measure x. Alt. int. ∡s are ≅, so the bisector is ∥ to the side common to the ≅ int. ∡s.

Sep 22-11:06 AM