Find each measure.
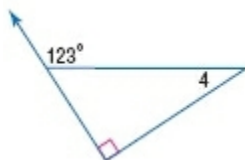
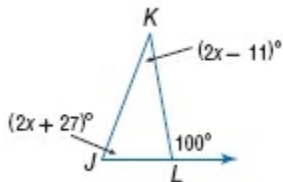18. $m\angle 3$

ANSWER:

65

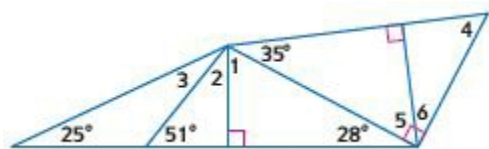20. $m\angle 4$

ANSWER:

33

22. $m\angle JKL$

ANSWER:

31

REGULARITY Find each measure.

24. $m\angle 1$

ANSWER:

62

25. $m\angle 2$

ANSWER:

39

26. $m\angle 3$

ANSWER:

26

27. $m\angle 4$
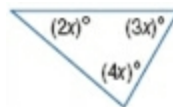
ANSWER:

55

28. $m\angle 5$

ANSWER:
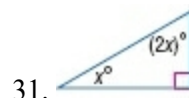
55

29. $m\angle 6$

ANSWER:

35

ALGEBRA Find the value of x. Then find the measure of each angle.

30.
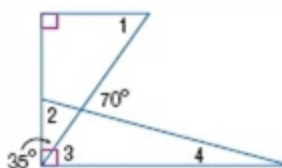
ANSWER:

$x = 20$; 40, 60, 80

31.

ANSWER:

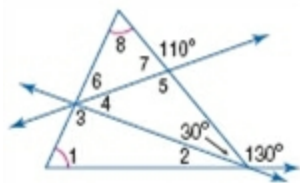$x = 30$; 30, 60

REGULARITY Find the measure of each numbered angle.

36.

ANSWER:

$m\angle 1 = 55$, $m\angle 2 = 75$, $m\angle 4 = 15$, $m\angle 3 = 55$
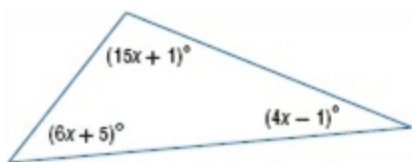
4-1 Angles of Triangles

37.

ANSWER:

$m\angle 1 = 65$, $m\angle 2 = 20$, $m\angle 3 = 95$, $m\angle 4 = 40$, $m\angle 5 = 110$, $m\angle 6 = 45$, $m\angle 7 = 70$, $m\angle 8 = 65$

38. **ALGEBRA** Classify the triangle shown by its angles. Explain your reasoning.

ANSWER:

Obtuse; the sum of the measures of the three angles of a triangle is 180. So, $(15x + 1) + (6x + 5) + (4x - 1) = 180$ and $x = 7$. Substituting 7 into the expressions for each angle, the angle measures are 106, 47, and 27. Since the triangle has an obtuse angle, it is obtuse.

47. **WRITING IN MATH** Explain how you could use the image shown to prove that the sum of the measures of the interior angles of a triangle is 180.
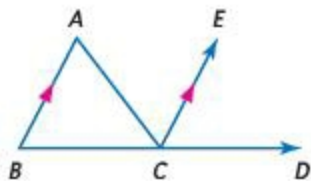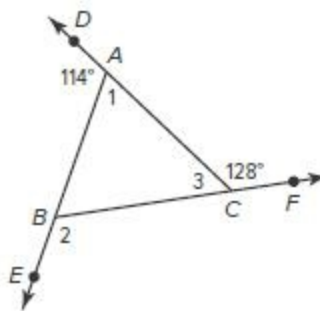

ANSWER:

We want to prove that $m\angle BAC + m\angle ABC + m\angle ACB = 180$. By the Angle Addition Postulate and the definition of a straight angle, $m\angle ACB + m\angle ACE + m\angle ECD = 180$. Because $\overrightarrow{AB} \parallel \overrightarrow{EC}$, $\angle BAC \cong \angle ACE$ by the Alternate Interior Angles Theorem. Similarly, $\angle ABC \cong \angle ECD$ by the Corresponding Angles Postulate. Thus, by substitution, $m\angle BAC + m\angle ABC + m\angle ACB = 180$.

50. **REASONING** If an exterior angle adjacent to $\angle A$ is acute, is $\triangle ABC$ acute, right, obtuse, or can its classification not be determined? Explain your reasoning.

ANSWER:

Obtuse; since the exterior angle is acute, the sum of the remote interior angles must be acute, which means the third angle must be obtuse. Therefore, the triangle must be obtuse.
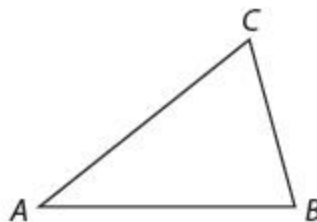
53. Find the measure of each numbered angle.

ANSWER:

66; 118; 52

55. In the figure, $m\angle B = 75$. The measure of $\angle A$ is half the $m\angle C$. What is $m\angle C$?

ANSWER:

70