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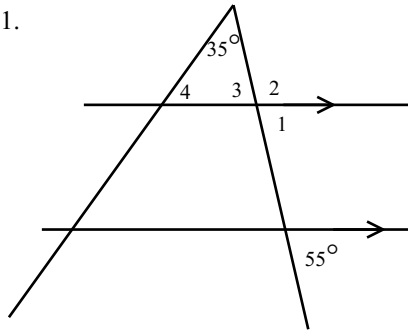
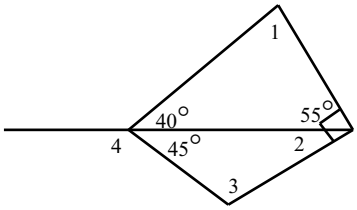
For problems 1-3, find each numbered angle and give a reason for each answer.

1.



2.



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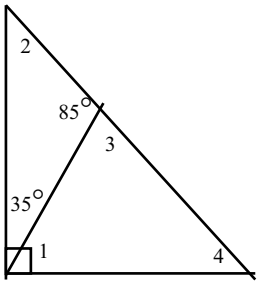
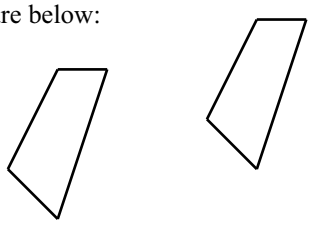


4. Name the transformation shown in the figure below:



5. Given ΔABC with points A(1, 5), B(6, 3) and C(8, 7). The triangle is reflected across the y-axis to form $\Delta A'B'C'$. Find the point B'.

6. Given ΔABC with points A(-1, 5), B(-2, -3) and C(2, 3). The triangle is translated to form $\Delta A'B'C'$ where A' is the point (4, 2). Find the point B'.

7. Given ΔXYZ with points X(-3, 1), Y(1, 4) and Z(5, 2). The triangle is reflected across the x-axis to form $\Delta X'Y'Z'$. Find the point Z'.

8. Given ΔXYZ with points X(0, 2), Y(0, 5) and Z(-2, 4). The triangle is rotated 90° counterclockwise around the origin to form $\Delta X'Y'Z'$. Find the point Z'.

9. Given ΔXYZ with points X(4, 0), Y(8, 0) and Z(5, 3). The triangle is rotated 180° counterclockwise around the origin to form $\Delta X'Y'Z'$. Find the point Z'.

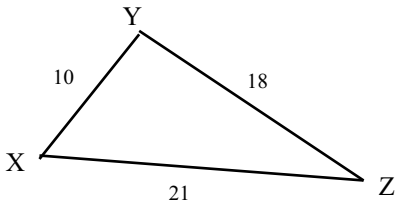
10. Can the following set of three sides form a triangle? Yes or no.

a. 14, 20, 34
b. 4, 19, 4
c. 11, 5, 8

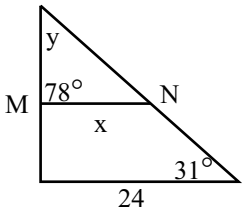
11. Find the maximum and minimum values for the third side of a triangle with two sides given

a. 60 and 62
b. 14 and 20

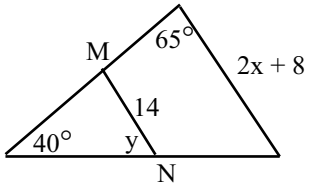
12. List the three angles of the triangle in order from smallest to largest.



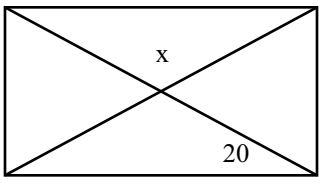
13. Find x and y in the figure given M and N are midpoints.



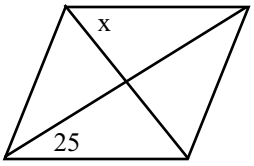
14. Find x and y in the figure given M and N are midpoints.



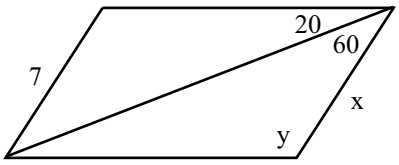
15. Find x in the rectangle



16. Find x in the rhombus.



17. Find x and y in the parallelogram.



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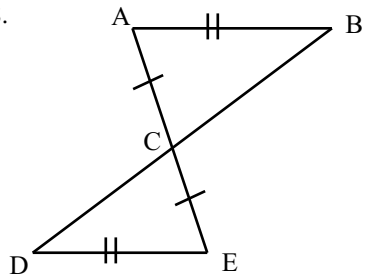
For problems 18-31, if the two triangles shown are congruent, give a reason (SSS, SAS, ASA, AAS, or HL) why they are congruent and write a correct congruence statement. If there is not enough information to say the triangles are congruent, write "not congruent".

18.



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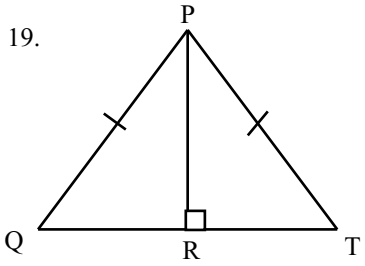

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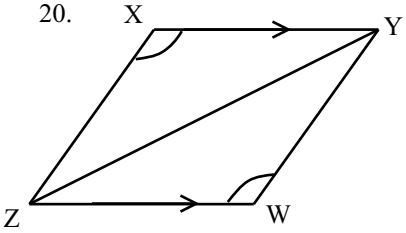

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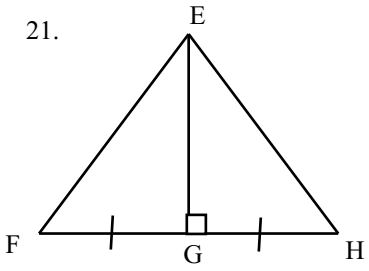

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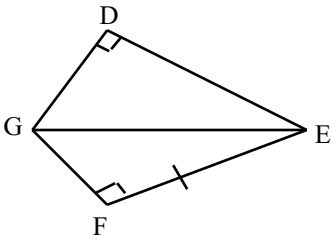

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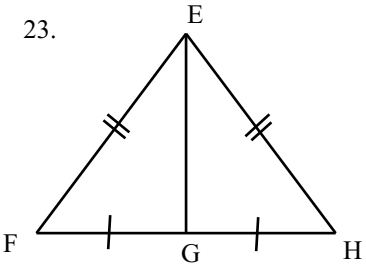

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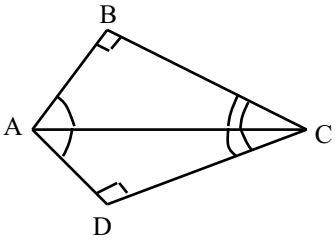

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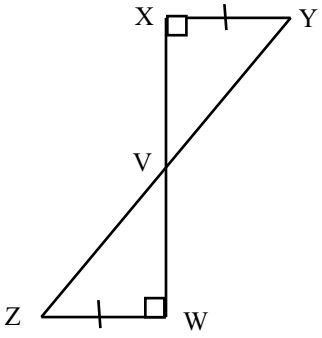

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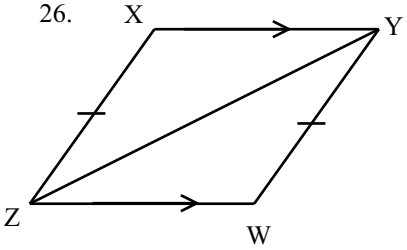

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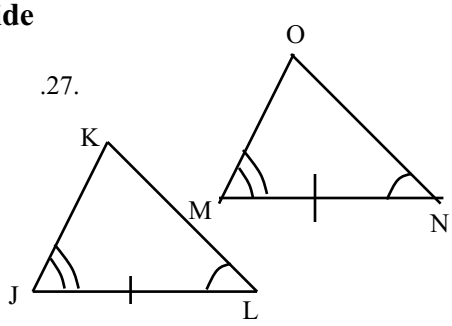

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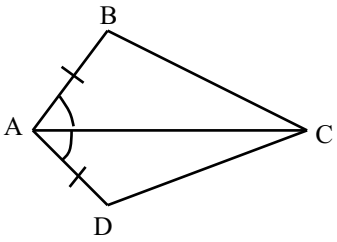
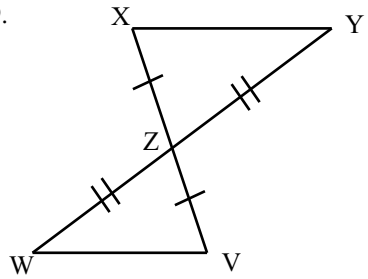


29.



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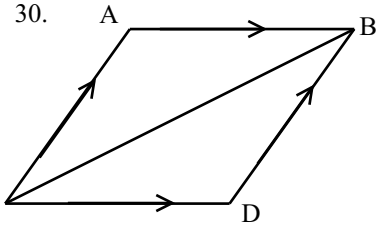
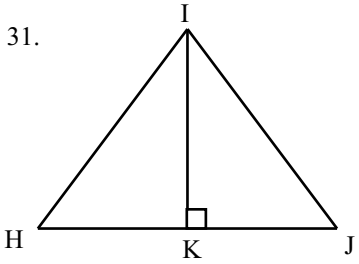


31.



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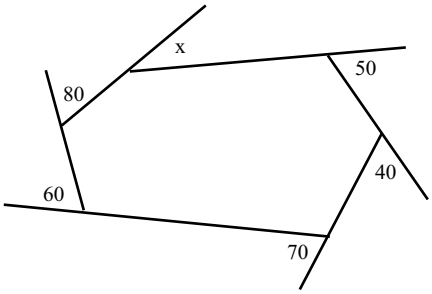
32. Find the sum of the measures of the exterior angles of a 20-gon.

33. Find the measure of one exterior angle of a regular 15-gon

34. The measure of one interior angle of a regular polygon is 120°. Find the number of sides of the polygon.

35. The measure of one exterior angle of a regular polygon is 40°. Find the number of sides of the polygon.

36. Find x in the diagram below:



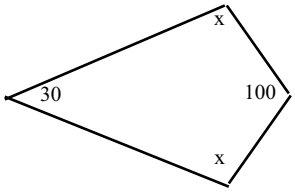
37. Find the sum of the measures of the interior angles of a hexagon.

38. Find the measure of one interior angle of a regular 15-gon

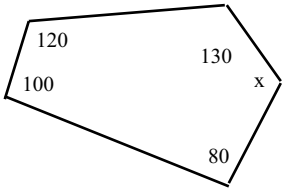
39. The sum of the measures of the interior angles of a polygon is 3240. Find the number of sides of the polygon.

40. Find x in each diagram below.

a.

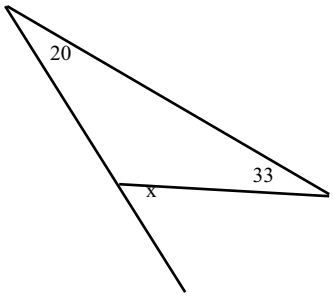


b.

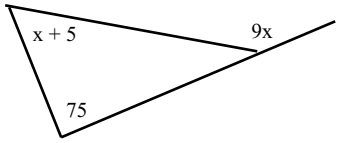


For problems 41-53, find x in each figure.

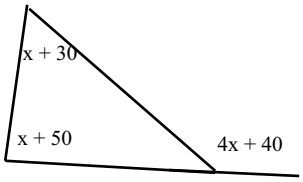
41.



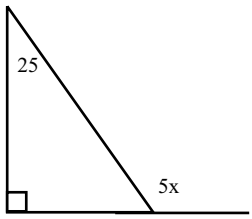
42.



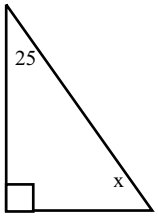
43.



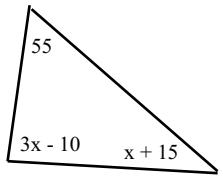
44.



45.



48.



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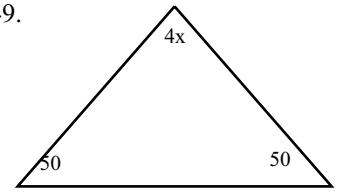
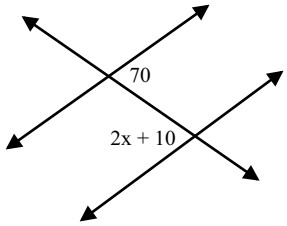
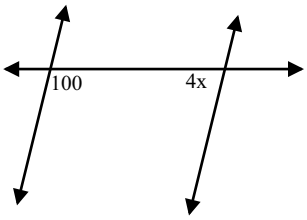


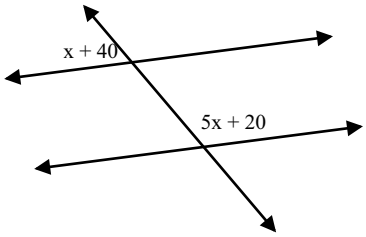
50.



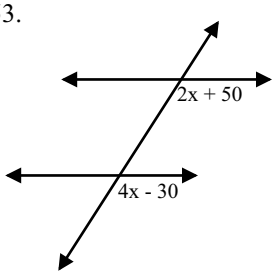
51.



52.



53.



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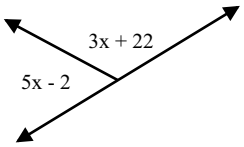
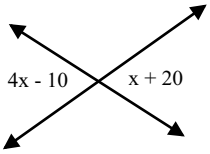
For problems 54-, find x in each figure.

54.

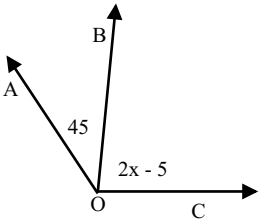


55. $\angle 1$ and $\angle 2$ are complementary.
$m\angle 1 = 3x + 10$
$m\angle 2 = 2x$
Find x.

56.



57. $m\angle AOC = 130°$



58. $\angle 1$ and $\angle 2$ are supplementary
$m\angle 1 = 3x$
$m\angle 2 = x + 20$
Find x.

59. Write the *inverse*, *converse*, and *contrapositive* of the conditional statement. Decide whether the converse is true or false. If false, provide a counterexample.

a. If x = 12, then $x^2 = 144$.
b. If a number is odd, then it is divisible by three.
c. If a figure is a square, then all of its angles are right angles.

60. Write an indirect proof to show that a triangle can have at most one obtuse angle.

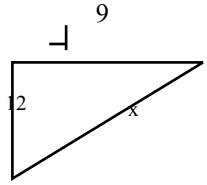
61. For each pair of points, find the *midpoint* **and** *length* of the segment connecting the points.

a. (-3, 1) and (4, 4)

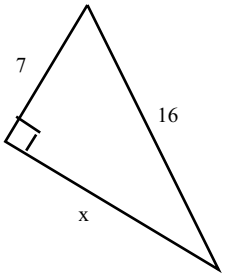
b. (-1, 2) and (-7, -6)

For problems 62-63, use the Pythagorean Theorem to find the length of x.

62.

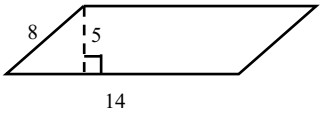


63.



For problems 64-68, find the area of each figure.

64.



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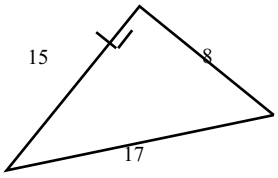

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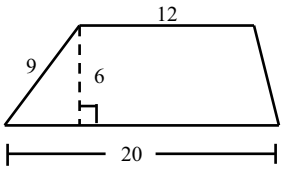

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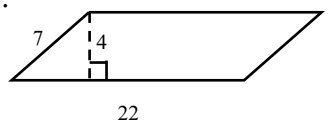
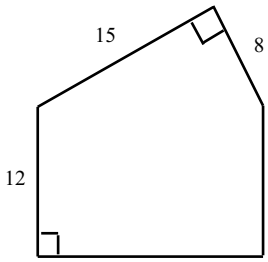
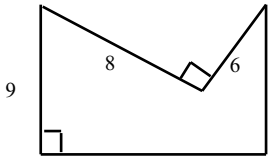


For problems 68-69, find the area and perimeter of each figure.

68.



69.



70. Find the area of the shaded region.