

Properties of Triangles and Parallelograms

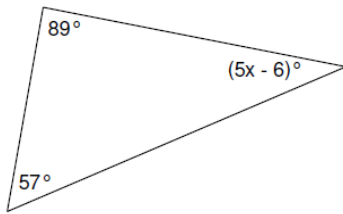
Topic: Triangle Characteristics & Proving Triangles on the Coordinate Plane

Things to Remember:

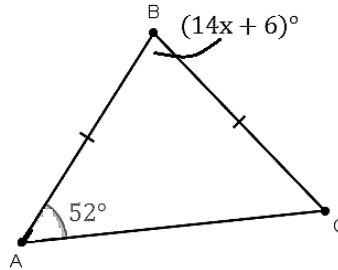
- ✓ All angles in a triangle are 180°
- ✓ The exterior angle = the sum of the two non-adjacent interior angles
- ✓ Scalene triangles have all different sides
- ✓ Isosceles triangles have two **sides** and **base angles** that are congruent
- ✓ Equilateral triangles have all sides and angles congruent
- ✓ Right triangles have a 90° angle made by two perpendicular sides

Examples:

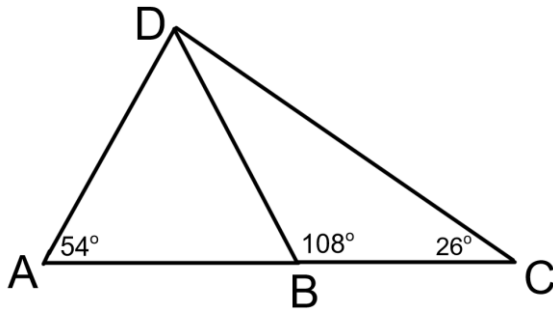
1. Solve for x



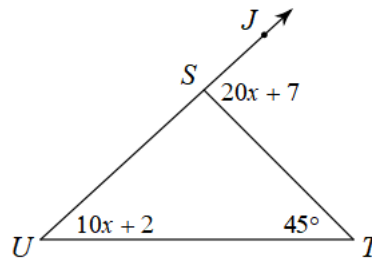
2. Solve for x.



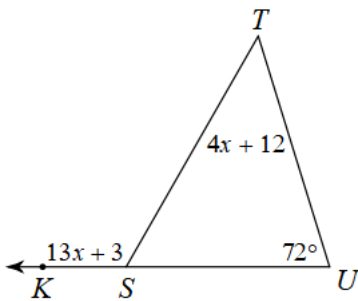
3. Solve for $\angle DBA$ and $\angle ADB$



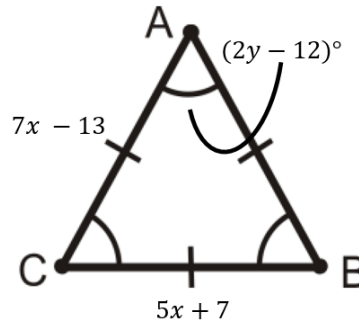
4. Solve for x



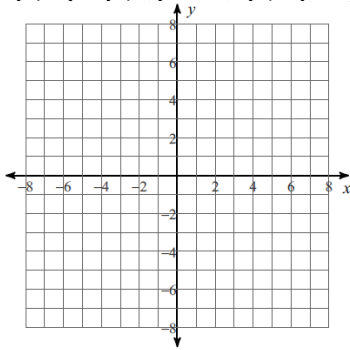
5. Solve for $\angle TSU$.



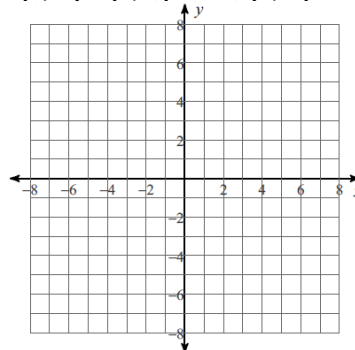
6. Solve for x and y.



7. Prove that $\triangle ABC$ is a scalene right triangle.
 $A(1, 1)$ $B(4, 4)$ and $C(6, 2)$



8. Prove that $\triangle DEF$ is an isosceles triangle.
 $D(1, 1)$ $E(5, 2)$ and $F(2, 5)$

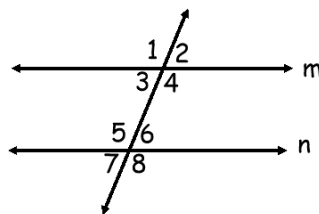


Topic: Parallel Lines

Things to Remember:

- ✓ Corresponding Angles = same location in the group of 4; congruent
- ✓ Alternate Angles = both on inside or outside and "jump" over transversal; congruent
- ✓ Side-Side (Consecutive) Angles = both on inside or outside and DO NOT "jump" over transversal; supplementary

Examples:



9. Name the special relationship each pair of angles have in the parallel lines above.

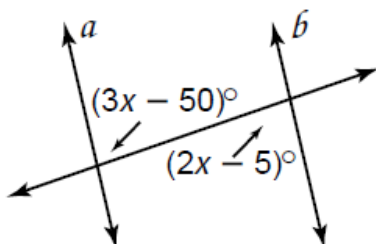
- a. $\angle 1$ and $\angle 5$
- b. $\angle 4$ and $\angle 6$
- c. $\angle 2$ and $\angle 8$
- d. $\angle 4$ and $\angle 5$
- e. $\angle 2$ and $\angle 7$
- f. $\angle 6$ and $\angle 8$

**If the $m\angle 6 = 74^\circ$, mark the diagram above with the rest of the angle measures.

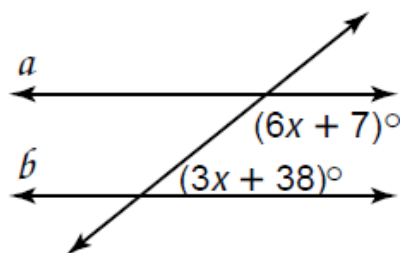
10. Use the parallel lines **diagram** above (not the measures labeled).

If the $m\angle 6 = (2x + 16)^\circ$ and the $m\angle 1 = (5x - 4)^\circ$, what is the $m\angle 7$?

11. Solve for x.



12. Solve for x.



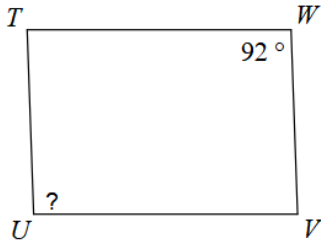
Topic: Parallelogram Characteristics

Things to Remember:

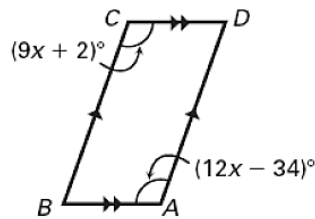
- ✓ **Parallelograms** – Opposite sides are congruent and parallel; diagonals bisect each other
- ✓ **Rhombus** – Everything about a parallelogram PLUS all sides are equal
- ✓ **Rectangle** – Everything about a parallelogram PLUS diagonals are congruent
- ✓ **Square** – Everything about a parallelogram, rhombus, and rectangle

Examples:

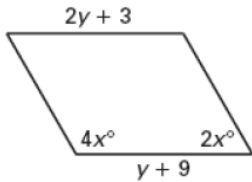
13. Solve for the indicated angle.



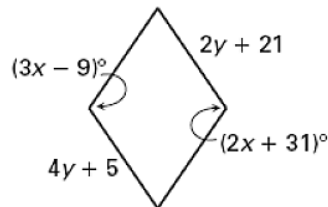
14. $\square ABCD$ is a parallelogram. Solve for x.



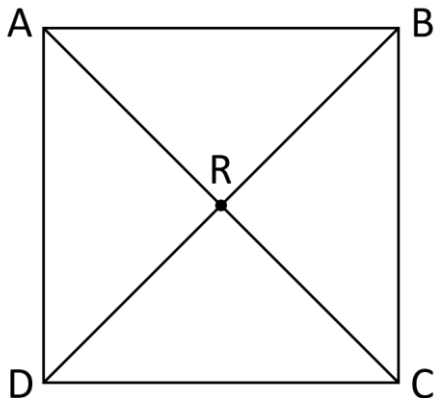
15. Find the value of x and y in the parallelogram.



16. Find the value of x and y in the parallelogram.



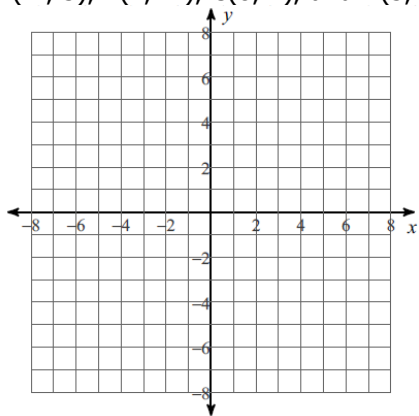
Use the following figure for Questions 17 and 18



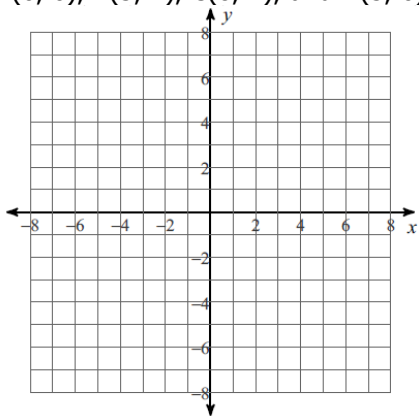
17. $\square ABCD$ is a square. $DB = 3x - 10$ and $AR = x$, what is the value of x?

18. $\square ABCD$ is a square. $DC = 8$, what is the length of DB?

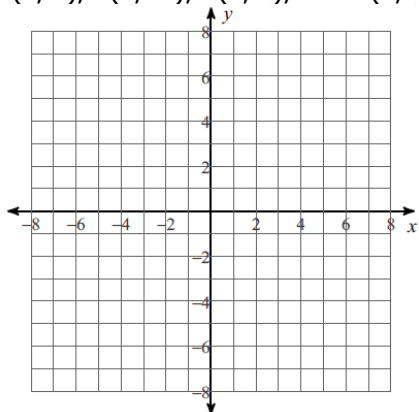
19. Prove that $\square ABCD$ is a parallelogram.
 $A(-1, 3)$, $B(2, -1)$, $C(8, 1)$, and $D(5, 5)$



20. Prove that $\square ABCD$ is a rhombus.
 $A(0, 0)$, $B(3, 4)$, $C(8, 4)$, and $D(5, 0)$



21. Prove that $\square ABCD$ is a rectangle.
 $A(1, 2)$, $B(2, -1)$, $C(8, 1)$, and $D(7, 4)$



22. Prove that $\square ABCD$ is a square.
 $A(2, 4)$, $B(3, -1)$, $C(-2, -2)$, and $D(-3, 3)$

