

1a. Find the midpoint and the distance between the points (2, 3) and (-1, 4).

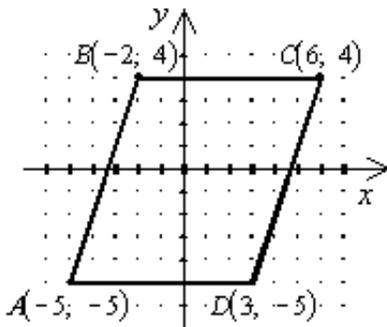
1b. If C(-5, 7) is the midpoint of segment  $\overline{AB}$  and A(8, 15) find the coordinates of B.

2. Micah is traveling to Peru for a summer vacation. Looking at a map of the path of her flight she notices that she leaves Chicago which is located at (35.6, 16.4) on the map's coordinate grid and changes planes at Panama, located at (8.2, -12.3). Amazingly, Panama is the midpoint of her trip to Peru. What are the coordinates of Peru on the map?

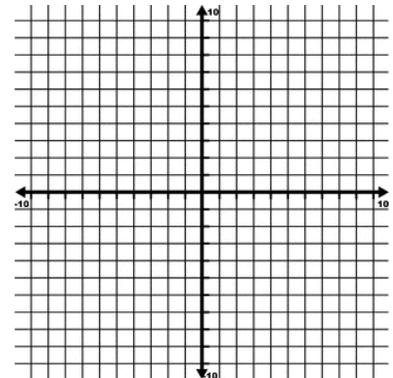
3. Triangle ABC has points A(5, 2), B(-3, 7) and C(1, -5).  
a. What is the equation of the median to side BC?

b. What is the equation of the perpendicular bisector to side AC?

4. If  $AB = \sqrt{90}$   $AD = 8$ , determine whether ABCD below is a parallelogram.



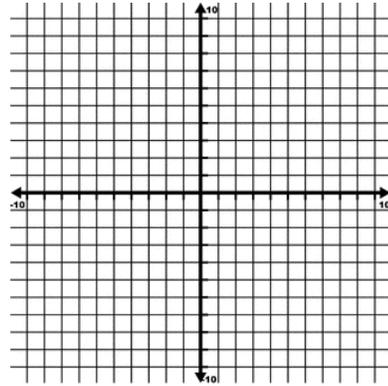
5. Prove or disprove that the triangle with vertices R(-2, -2), S(1, 4), and T(4, -5) is an equilateral triangle.



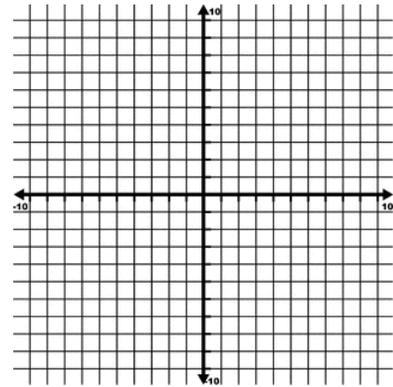
6. If the leg of a right triangle is 6 and the hypotenuse is 11. Find the missing leg in simplest radical form.

7. If the legs of a right triangle are  $2x$  and  $7x$ , and the hypotenuse is 12. Find  $x$ .

8.  $\triangle ABC$  has vertices  $A(-4, 1)$ ,  $B(-3, 4)$ , and  $C(-1, 1)$ .  $\triangle DEF$  has vertices  $D(2, -3)$ ,  $E(5, -2)$ , and  $F(2, 0)$ . Prove or disprove that the triangles are congruent.



9. Prove or disprove that the quadrilateral formed by  $A(-2, 3)$ ,  $B(5, 3)$ ,  $C(3, -1)$  and  $D(-3, -1)$  is a parallelogram.



10. Suppose you wish to prove that the mid-point of the hypotenuse of a right triangle is the same distance from each of its three vertices. Draw the right triangle on a coordinate grid so that it represents all right triangles. Be strategic on where you locate the triangle. Complete the proof.

