

Write

Describe how the Distance Formula and the slope formula can be used to classify triangles and quadrilaterals on the coordinate plane.

Remember

The Distance Formula states that if (x_1, y_1) and (x_2, y_2) are two points on the coordinate plane, then the distance d between the points is given by $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

Practice

1. The grid represents a map of Jose's neighborhood. It shows the locations of his house as well as the houses of four friends.

a. Draw a triangle between the houses of Jose, Ed, and Brad. Determine whether this triangle is a scalene, isosceles, or equilateral triangle. Explain your reasoning.

b. Determine whether the triangle is a right triangle. Explain your reasoning. If it is not a right triangle, determine whether it is acute or obtuse.

c. Jose, Miles, and Brad are meeting for band rehearsal. Miles claims that the distance from Jose's house to his house is the same as the distance from Jose's house to Brad's house. Is his claim correct? Explain your answer. What kind of triangle is formed if you connect their houses?

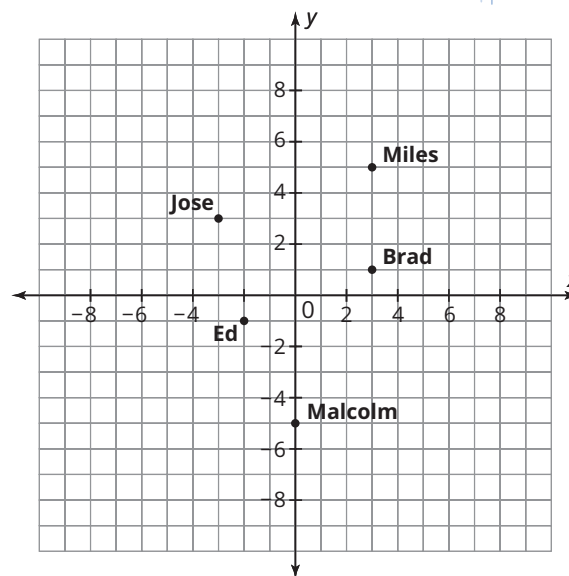
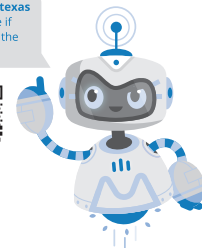
d. A new boy, James, moved into the neighborhood at the location $(-3, -5)$. Plot and label James's house on the grid. Then, determine whether the triangle formed by connecting his house, Jose's house, and Malcolm's house is a right triangle.

2. Susan is an interior floor designer. When designing a new floor, she uses a coordinate grid to represent the room. The client wants a rectangular tile insert to be placed in the floor of the room. The coordinates for 3 of the corners of the insert are $A(-7, -4)$, $B(1, 6)$, and $C(6, 2)$.

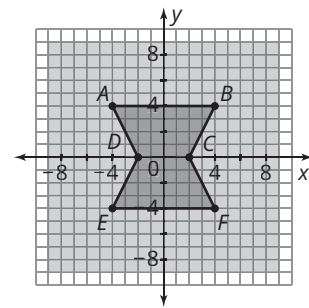
a. Plot and label the points on a coordinate plane, then determine the coordinates of the fourth point of the rectangular tile insert. Plot this as point D and connect the points to form the rectangle.

b. To prove the figure you drew is a rectangle, verify that the length of opposite sides are equal.

Visit livehint.com/texas or use this QR code if you need a hint on the Practice questions.



3. A client of Susan's has asked her to create a new wood floor for his living room. The design will be created by laying wood strips in different directions, as shown on the coordinate grid. Determine whether Quadrilateral $ABCD$ can best be described as a trapezoid, a rhombus, a rectangle, or a square. Explain your reasoning.



Stretch

The lines that connect points A , B , and C in a coordinate plane form a right triangle. Point A is located at $(-2, 5)$. Point B is located 6 units down from point A and an unknown distance to the left. Point C is located 4 units to the right of point A and an unknown distance down. The angle at point B is a right angle. The slope of the line between point B and point C is $-\frac{1}{3}$. The distance between point A and point B is $\sqrt{40}$. Determine the coordinates of point B and point C .

Review

- Write the equation of a line that passes through the point $(-8, 2)$ and is parallel to the line $3x - 2y = 12$.
- Write the equation of a line that passes through the point $(5, -7)$ and is perpendicular to the line $-2x + 6y = -4$.
- List the properties that are shared by each pair of polygons.
 - squares and equilateral triangles
 - rectangles and rhombi