Assignment

Write

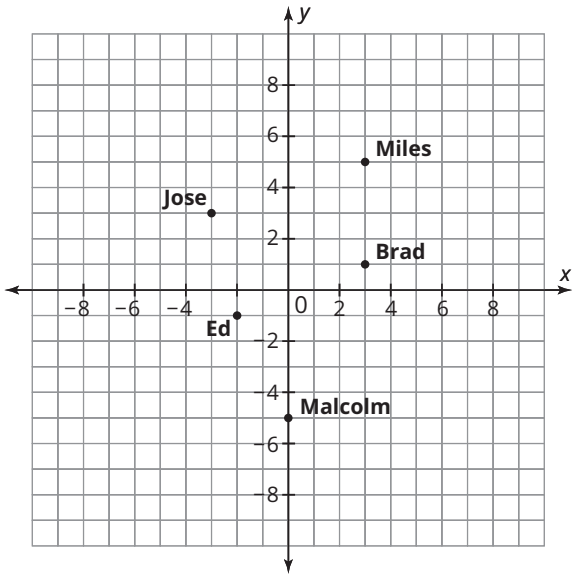
Describe how the Distance Formula and the slope formula can be used to classify triangles and quadrilaterals on the coordinate plane.

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

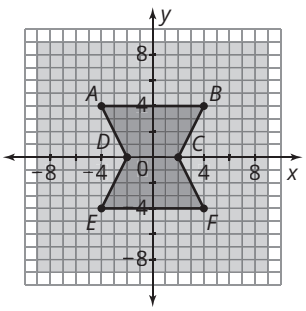
1. The grid represents a map of Jose's neighborhood. It shows the locations of his house as well as the houses of four friends.



   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.

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 to the left of point *A*. Point *C* is located 4 units to the right of point *A* and down from point *A*. 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

1. The Build-A-Dream construction company has plans for two models of the homes they build, Model A and Model B. The Model A home requires 18 single windows and 3 double windows. The Model B home requires 20 single windows and 5 double windows. A total of 1,800 single windows and 375 double windows have been ordered for the developments.
   a. Write and solve a system of equations to represent this situation. Define your variables.
   b. Interpret the solution of the linear system in terms of the problem situation.
2. A company produces two types of TV stands. Type I has 6 drawers. It requires 3 single drawer pulls and 3 double drawer pulls. The company needs 75 hours of labor to produce the Type I TV stand. Type II has 3 drawers. It requires 6 single drawer pulls. The company needs 50 hours of labor to produce the Type II TV stand. The company only has 600 labor hours available each week, and a total of 60 single drawer pulls available in a week. For each Type I stand produced and sold, the company makes $200 in profit. For each Type II stand produced and sold, the company makes $150 in profit.
   a. Identify the constraints as a system of linear inequalities. Let *x* represent the number of 6 drawer TV stands produced and let *y* represent the number of 3 drawer TV stands produced.
   b. Graph the solution set for the system of linear inequalities. Label all points of the intersection of the boundary lines.
   c. Write an equation in standard form for the profit, *P*, that the company can make.
   d. How many of each type of stand should the company make if they want to maximize their profit? What is the maximum profit?
3. Each function is a transformation of the linear basic function $f(x) = x$. Graph each transformation.
   a. $g(x) = \frac{1}{3}x - 2$ b. $h(x) = -2x + 1$