

Assignment

Write

Describe how the Distance Formula and the slope formula can be used to find the height of a triangle on the coordinate plane.

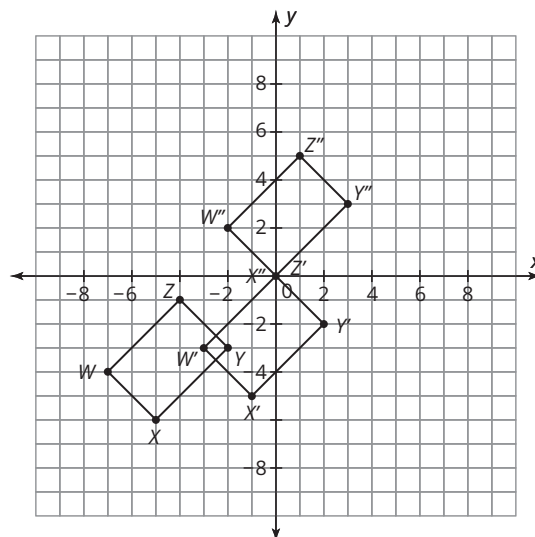
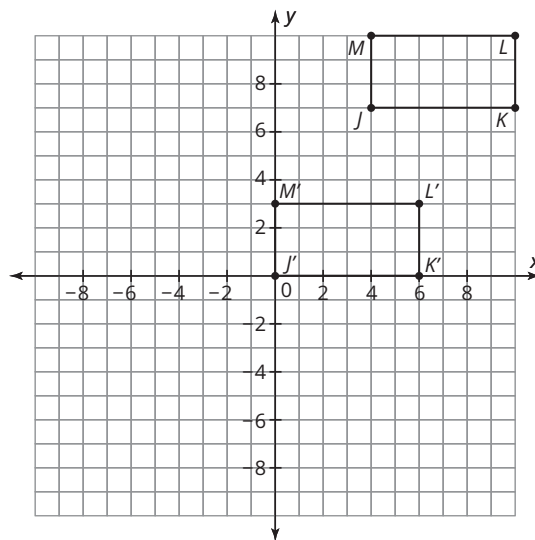
Remember

Rigid transformations can make calculating the perimeter and area of figures on the coordinate plane more efficient.

Any side of a triangle can be considered its base, and the height of the triangle is the perpendicular distance from the base to the opposite vertex.

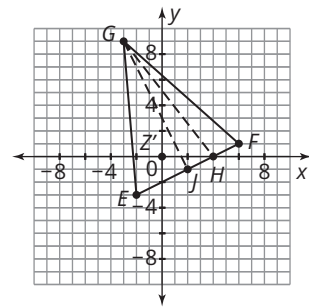
Practice

1. Franco translates rectangle $JKLM$ so that it has one vertex on the origin. The result is rectangle $J'K'L'M'$. He claims that he doesn't even have to use the Distance Formula to calculate the perimeter and area of this translated rectangle.
 - a. Is Franco correct? Why or why not?
 - b. Maeko claims that you don't have to use the Distance Formula or translate the rectangle in order to calculate the perimeter and area of the original rectangle. Is she correct? Why or why not?
 - c. Give an example of a case in which translating a rectangle to the origin would be extremely helpful in simplifying the calculations for determining the perimeter and area of the rectangle.
2. Olivia translates rectangle $WXYZ$ vertically up 1 unit and horizontally to the right 4 units to produce the image $W'X'Y'Z'$. Thom translates the rectangle vertically up 6 units and horizontally to the right 5 units to produce the image $W''X''Y''Z''$.
 - a. Would you prefer to use Olivia's translation or Thom's translation to determine the perimeter and area of the rectangle? Explain your reasoning.
 - b. Calculate the perimeter and area of the rectangle. Show your work.



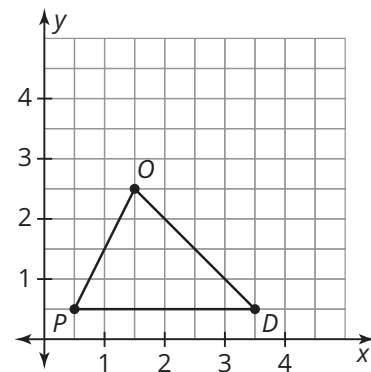
3. Cisco claims that \overline{GH} is the height of $\triangle EFG$, and Beth claims that \overline{Gj} is the height of $\triangle EFG$.

- Who is correct? Justify your response.
- Calculate the area of $\triangle EFG$. Show your work.



Stretch

- A few years ago, Leon planted a small triangular garden in his backyard. Recently he has been thinking that the garden is too small. He now wants to double the area of the garden. His original garden is shown on the coordinate plane. Each unit represents one square foot.
 - Describe two ways Leon could double the area of his garden.
 - Because of the location of Leon's neighbors, he cannot extend the garden any further horizontally. Use this information to manipulate $\triangle POD$ representing Leon's garden to double the area. Label the vertices of $\triangle PO'D$.
 - Determine the area of the original garden and the new garden to verify that the area has doubled.



Review

- The members of a youth football program are required to sell tickets to chicken dinners for the program's fundraiser. They can sell adult tickets for \$10 and child tickets for \$5. Each athlete must bring in at least \$350 from the ticket sales.
 - Write an expression to represent the total amount of money an athlete makes from ticket sales. Let x represent the number of adult tickets sold and let y represent the number of child tickets sold.
 - Write an inequality in two variables to represent the amount an athlete must make.
 - Graph the inequality from part (b).
 - Use the graph to determine whether an athlete will bring in at least \$350 if they sell 10 adult tickets and 30 child tickets. Explain your reasoning.
- The quadrilateral $ABCD$ has the vertices $A(-5, 4)$, $B(0, 6)$, $C(1, 3)$, and $D(-4, 1)$. Determine whether it can be classified as a parallelogram. Justify your reasoning.
- Triangle DEF has the vertices $D(-2, 3)$, $E(2, -1)$, and $F(-5, -4)$. Determine whether it is scalene, isosceles, or equilateral. Explain your reasoning.
- Solve for b in the equation $\frac{a-b}{12} = 11 - 6a$.