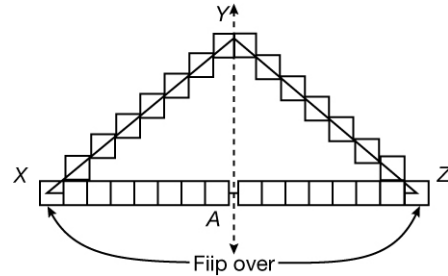


Puzzles and Games

Designers of games and puzzles need to plan how the games or puzzles will be packaged. They also need to list rules for players to follow.

1. This diagram shows one version of a board game. The board is designed so that it can be folded in half for shipping. That is, the board folds so that points X and Z coincide.



- a. What type of triangle should $\triangle XYZ$ be for this folding to work? Explain.

- b. In one preliminary version of the game board, the measure of $\angle X = 60^\circ$. If the measure of $\angle Z$ is the same, what is the measure of $\angle Y$? Show your solution.

2. Some of the tiles or spaces on a board game show prime numbers. One game rule is *If your chip lands on a prime number, then go back three spaces.*

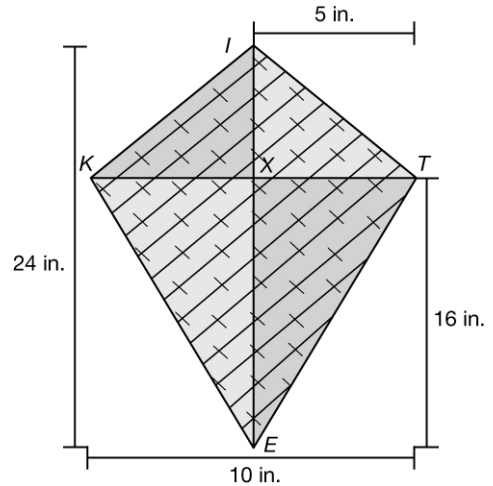
- a. Write this rule in the contrapositive.

- b. Can you tell from this rule whether the converse of the rule is true? Explain.

3. Donny and June invented a puzzle game for people who like to fly kites. The board for the game is in the shape of a kite and is shown here.

a. In this kite, $KI = IT$ and $KE = ET$. Find IX and KX . Show your work.

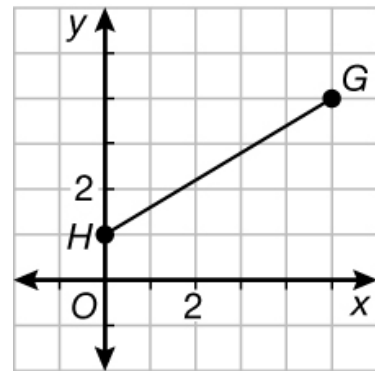
b. Explain how to find the area of polygon $KITE$. Then find the area of polygon $KITE$. Show your work.



4. Ted and Muriel started to design a puzzle that would lie on a grid.

a. Find the coordinates of points H and G .

b. Find an equation for the line that contains points H and G . Show your work.



c. Find the coordinates of the midpoint of \overline{HG} . Show your work.

5. A game rule states that if a player rolls an eleven on a pair of number cubes and lands on a bonus square, then that player gets a free roll of the cubes.

Roll of eleven	Bonus square	Conjunction
T	T	
T	F	
F	T	
F	F	

a. Complete this truth table for the conjunction.

b. Under what conditions will a player not get a free roll of the cubes?
