**PROBLEM SOLVING**

The graph of a proportional relationship has two features:

1. They all pass through the same part of a coordinate plane
2. They all have the same shape.

Solve the following problems to determine through which part of the coordinate plane the graph passes and to determine its shape.

The tables below show the race times of two different teams in a hiking challenge. Graph the points for each team on the coordinate plane.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **Team Wildcats** | | | **Time (hrs)**  **x** | **Distance (miles)**  **y** | | 1 | 2.5 | | 2 | 5 | | 3 | 7.5 | | 4 | 10 | | 5 | 12.5 | | 6 | 15 | | |  |  | | --- | --- | | **Team Knights** | | | **Time (hrs)**  **x** | **Distance (miles)**  **y** | | 1 | 4 | | 2 | 6 | | 3 | 8 | | 4 | 10 | | 5 | 12 | | 6 | 14 | |
|  |  |

1. For which team is the distance proportional to the time. Explain.
2. What shape are the graphs?
3. Through what part of the graph does the proportional relationship pass?

The table on the left shows the area of a square based on the length of a side.

The table on the right shows the perimeter of a square based on the length of a side.

Graph the values on the coordinate planes.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **Side Length** | **Area** | | **x** | **y** | | 1 | 1 | | 2 | 4 | | 3 | 9 | | 4 | 16 | | 5 | 25 | | |  |  | | --- | --- | | **Side Length** | **Perimeter** | | **x** | **y** | | 1 | 4 | | 2 | 8 | | 3 | 12 | | 4 | 16 | | 5 | 20 | |
|  |  |

1. Which of the two tables show a proportional relationship?
2. What are the shapes of the graphs?
3. What is the shape of the graph of the proportional relationship?
4. Through what part of the graph do the graphs pass?

**CONCLUSION**

1) What shape do the proportional graphs have in common?

2) Through what part of the graph do the proportional graphs pass?