Piglet Noses Answer Guide

Working in groups, you will examine the distribution of comfortable piglets on a mat. Each member of your group will use a four-quadrant coordinate system grid with 15 piglets. Each piglet's nose is plotted as a point. Your group will record the coordinates for each "nose" point. Analyzing nose points will show piglet comfort zones.

1. What are the coordinates of Nose B?

(5, 4)

a. Which piglet nose is a reflection of Nose B over the *y*-axis? Use the coordinates to explain how you know.

Nose *G* because it has the opposite *x* value and same *y* value as Nose *B*.

b. Which nose is a reflection of Nose B over the *x*-axis? Use the coordinates to explain how you know.

Nose *J* because it has the opposite *y* value and same *x* value as Nose *B*.

c. In terms of absolute values, how are the coordinates similar?

The coordinates have the same absolute values.

2. What are the coordinates of Nose N? How far is Nose N away from the origin?

(-10, 0) 10 units from the origin

a. Are other noses the same distance from the origin? Using the nose coordinates, explain how you know.

Noses *M* and *P* are both 10 units away from the origin. Nose *M* (–10, 0) is on the *x*-axis 10 units to the left of the origin, and Nose *P* (10, 0) is on the *x*-axis 10 units to the right of the origin.

b. Both noses are the same distance away from the origin, but the values of their coordinates differ. Which nose has the smaller *x*-axis coordinate?

M < P because -10 < +10

3. What is the distance from Nose *F* to Nose *C*?

10 units

a. What is the distance from Nose *F* to Nose *G*?

7 units

b. Use the coordinates for Noses *C*, *F*, and *G* to write a rule for finding the distance between two opposite points with the same *x*-coordinates and a rule for finding the distance between two opposite points with the same *y*-coordinates.

When two opposite points have the same *y*-coordinates, the distance is the sum of the absolute values of the *x*-coordinates. When two opposite points have the same *x*-coordinates, the distance is the sum of the absolute value of the *y*-coordinates.

4. Which noses are at the same horizontal distance from the *y*-axis? How many units away from the *y*-axis are the noses? What do their coordinates have in common?

Noses *D*, *E*, and *L* are 3 units away from the *y*-axis. Noses *B*, *C*, *F*, *G*, *J*, and *K* are 5 units away from the *y*-axis. Noses *A*, *H*, and *I* are 6 units away from the *y*-axis. Noses *M* and *P* are 10 units away from the *y*-axis. Each unit group has the same |x| value.

5. Which noses are at the same vertical distance from the *x*-axis? How many units away from the *x*-axis are the noses? What do their coordinates have in common?

Noses *M* and *P* are 0 units away from the *x*-axis. Noses *C*, *F*, and *K* are 3 units away from the *x*-axis. Noses *B*, *G*, and *J* are 4 units away from the *x*-axis. Noses *D*, *E*, and *L* are 8 units away from the *x*-axis. Noses *A*, *H*, *I*, and *N* are 10 units away from the *x*-axis. Each unit group has the same |y| value.