

Name: _____ Period: _____ Date: _____

Polar Coordinates Word Problems

A surveyor mapping out the land where a new housing development will be built identifies a landmark 223 feet away and 45° left of center. A second landmark is 418 feet away and 70° right of center.

1. Sketch a graph to find the actual angles made by the points.

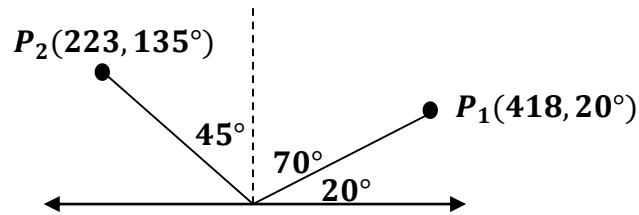
2. Find the distance between two points.

Polar Coordinates Word Problems

Answers

A surveyor mapping out the land where a new housing development will be built identifies a landmark 223 feet away and 45° left of center. A second landmark is 418 feet away and 70° right of center.

1. Sketch a graph to find the actual angles made by the points.



For P_1 , angle θ_1 is $90^\circ - 70^\circ = 20^\circ$ and $r_1 = 418$

For P_2 , angle θ_2 is $90^\circ + 45^\circ = 135^\circ$ and $r_2 = 223$

→ $P_1(418, 20^\circ)$ and $P_2(223, 135^\circ)$

2. Find the distance between two points.

The distance formula is,

$$P_1P_2 = \sqrt{r_1^2 + r_2^2 - 2r_1r_2\cos(\theta_2 - \theta_1)}$$

$$P_1P_2 = \sqrt{418^2 + 223^2 - 2(418)(223)\cos(135^\circ - 20^\circ)}$$

$$P_1P_2 = \sqrt{224453 - 186428\cos(115^\circ)}$$

→ $P_1P_2 = 550$