

ECS 455: In-Class Exercise # 2

Instructions

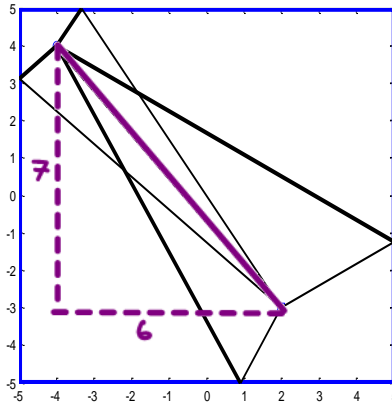
1. Separate into groups of no more than three persons.
2. The group cannot be the same as your former group.
3. Only one submission is needed for each group.
4. **Write down all the steps** that you have done to obtain your answers. You may not get full credit even when your answer is correct without showing how you get your answer.
5. **Do not panic.**

Date: <u>01/02/2017</u>			
Name			ID (last 3 digits)
Prapun			5 5 5

Consider the following wireless indoor communication in the figure below.

The transmitter, denoted by a circle, is located at (-4,4).

The receiver, denoted by a square, is located at (2,-3).



1. Calculate the propagation distance of the line-of-sight (LOS) path

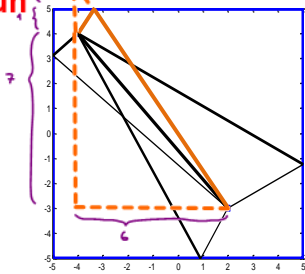
$$r_0^2 = (2 - (-4))^2 + (4 - (-3))^2 = 6^2 + 7^2 = 36 + 49 = 85$$

$$r_0 = \sqrt{85}$$

0102

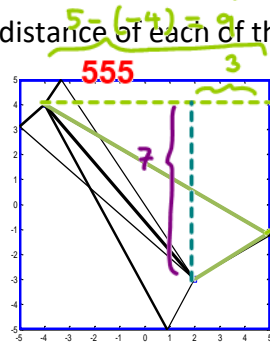
2. Calculate the propagation distance of each of the four paths that contain one reflection.

Prapun



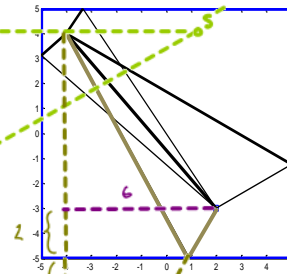
$$r_1^2 = 6^2 + (7+1+1)^2 = 36 + 81 = 117$$

$$r_1 = \sqrt{117}$$



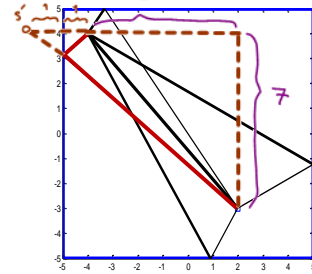
$$r_2^2 = 7^2 + (9+3)^2 = 49 + 144 = 193$$

$$r_2 = \sqrt{193}$$



$$r_3^2 = 6^2 + (2+9)^2 = 36 + 121 = 157$$

$$r_3 = \sqrt{157}$$



$$r_4^2 = 7^2 + (6+1+1)^2 = 49 + 64 = 113$$

$$r_4 = \sqrt{113}$$

Your answers should be of the form $\sqrt{\text{integer}}$.