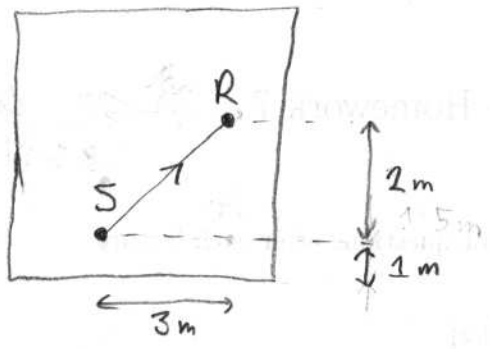


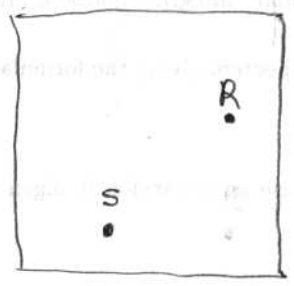
MATH 5 WORKSHEET : Image lattice

Consider a square room with source S & receiver. The walls are completely reflective (absorption $\alpha=0$)



What is the length of the direct path? [Hint: right triangle]

Draw all paths that reflect once off a wall between going $S \rightarrow R$.
on this diagram

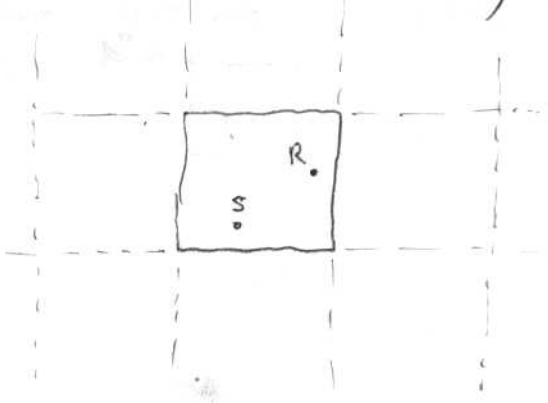


How many such paths are there?

Draw the image locations (S') which give the same signal at R

Compute the length of the path which reflects off the bottom wall:

Draw a path that bounces first off bottom wall then off right wall before reaching R:

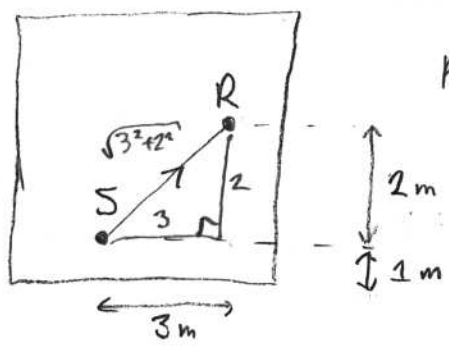


What image location did this come from [Hint: reflect it twice!]

What is the complete set of images accounting for all possible reflections? Draw the pattern.

MATH 5 WORKSHEET : Image lattice

Consider a square room with source & receiver. The walls are completely reflective (absorption $\alpha=0$)

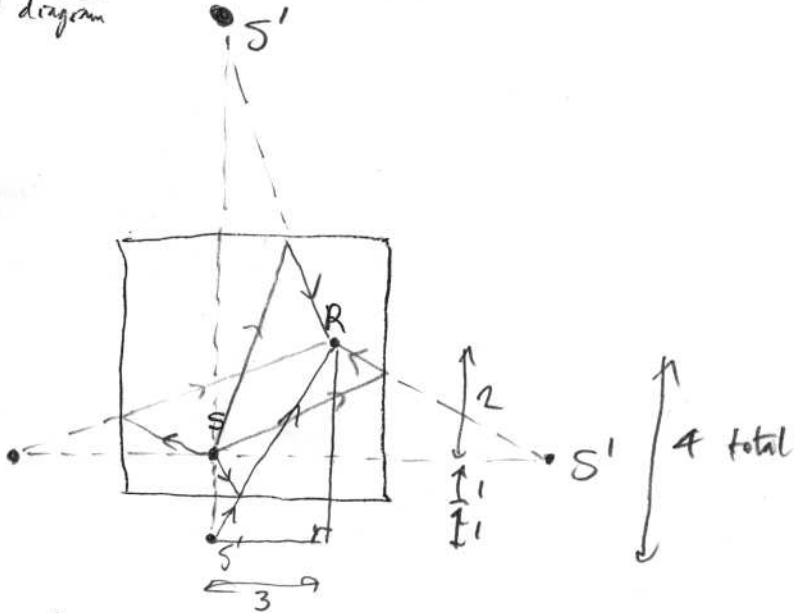


Pythagoras

What is the length of the direct path? [Hint: right triangle]

$$L = \sqrt{3^2 + 2^2} = \sqrt{13}$$

Draw all paths that reflect once off a wall between going S \rightarrow R

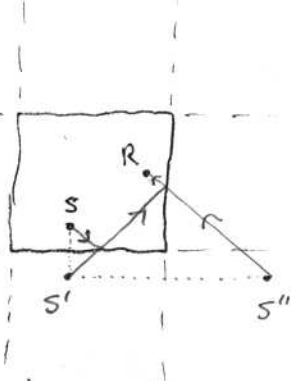


How many such paths are there?
 4

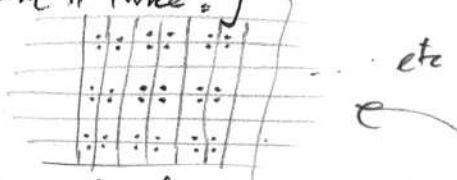
Draw the image locations (S') which give the same signal at R

Compute the length of the path which reflects off the bottom wall: $\sqrt{3^2 + 4^2} = 5$.

Draw a path that bounces first off bottom wall then off right wall before reaching R:



What image location did this come from [Hint: reflect it twice!]



What is the complete set of images accounting for all possible reflections? Draw the pattern.

2d lattice, ∞ number of reflection paths.
 'unfolding' the path to straight line S'' \rightarrow R