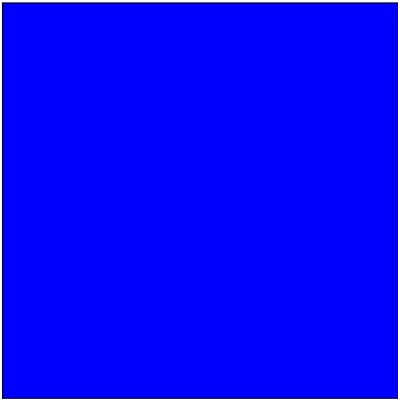


Plato's Meno and the Socratic Method

slideshow arranged by Daniel Lyle

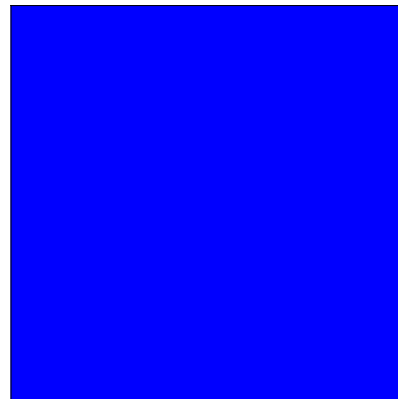
May 2004

SOCRATES: Now boy, you know that a square is a figure like this?

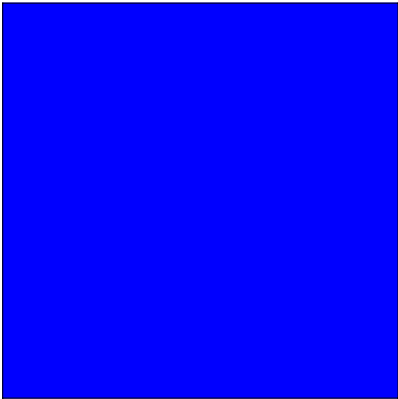


BOY: Yes.

SOCRATES: It has all these four sides equal?

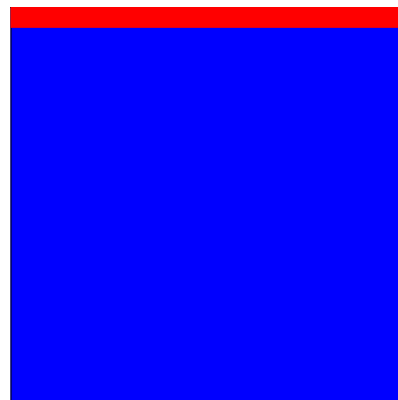


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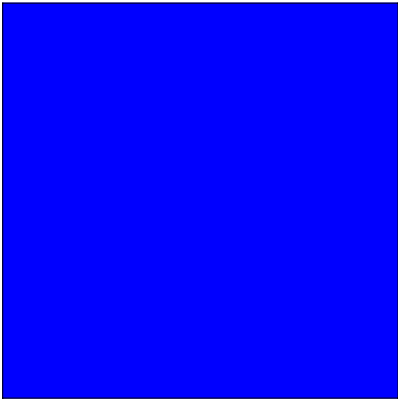


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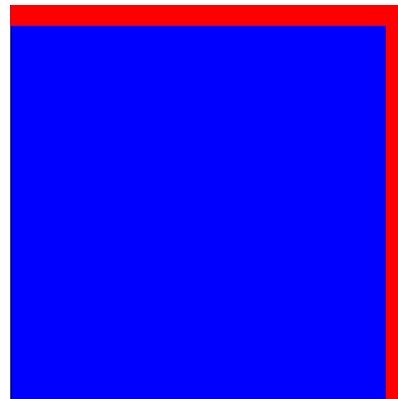


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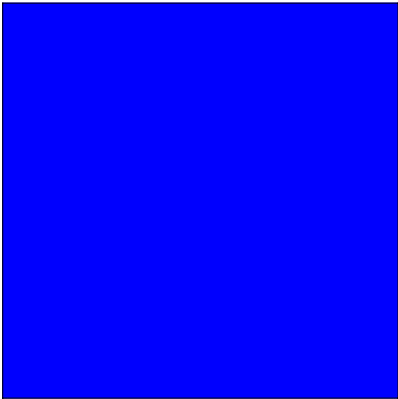


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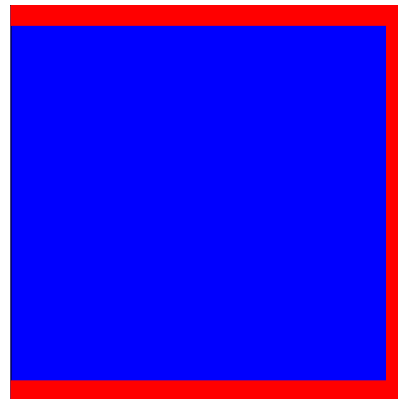


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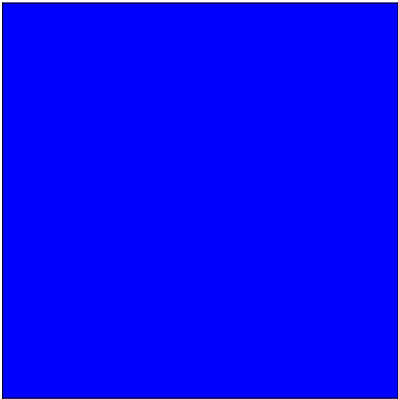


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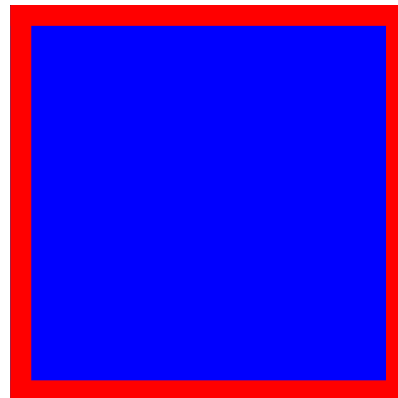


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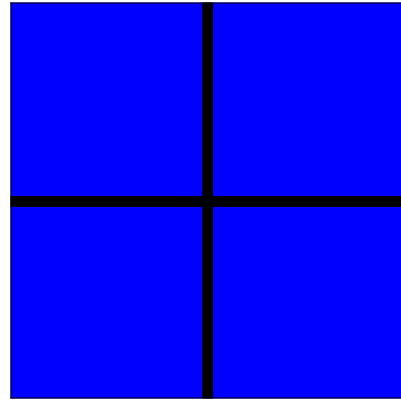


BOY: Yes.

SOCRATES: It has all these four sides equal?



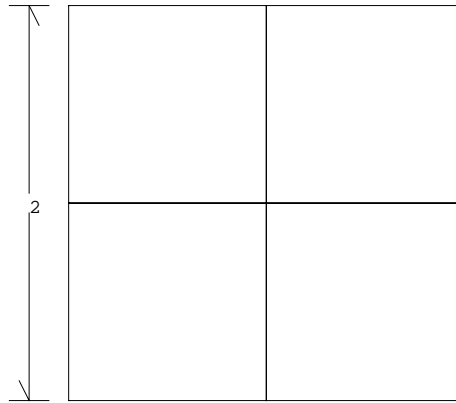
SOCRATES: And these lines which go through the middle of it are also equal?



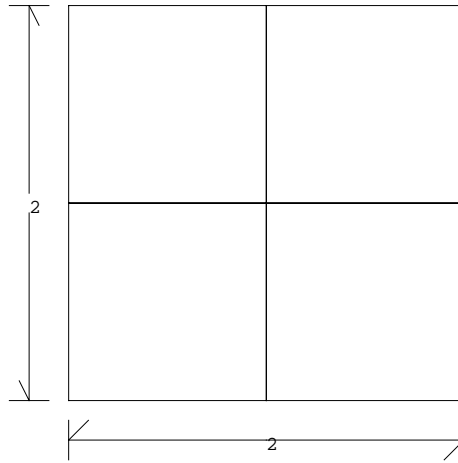
BOY: Yes.

SOCRATES: Such a figure could be either larger or smaller, could it not?

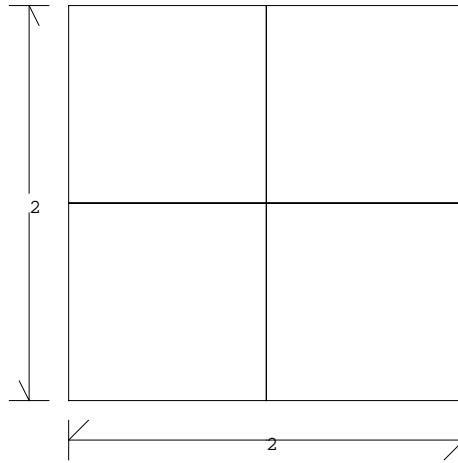
BOY: Yes.



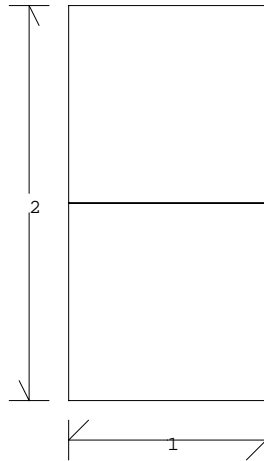
SOCRATES: Now if this side is two feet long,



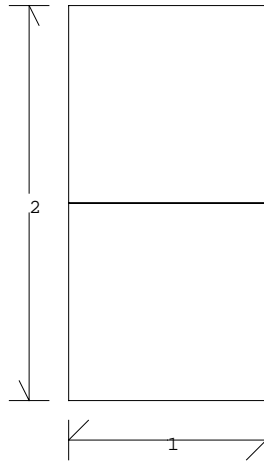
SOCRATES: and this side the same,



SOCRATES: how many feet will the whole be?

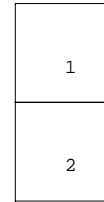
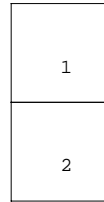


SOCRATES: Put it this way. If it were two feet in this direction and only one in that, must not the area be two feet taken once?



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BOY: Yes.

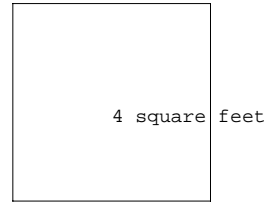


SOCRATES: And how many feet is twice two? Work it out and tell me.

1	3
2	4

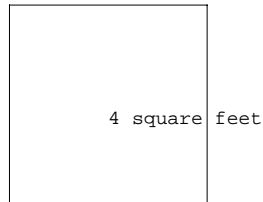
SOCRATES: And how many feet is twice two? Work it out and tell me.

BOY: Four.

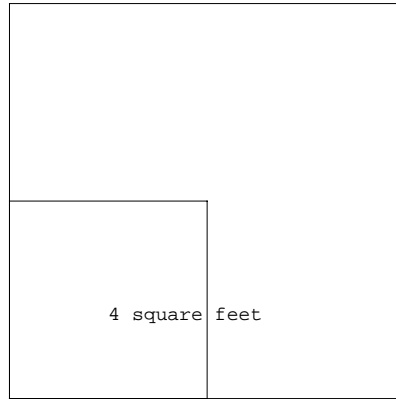


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BOY: Four.

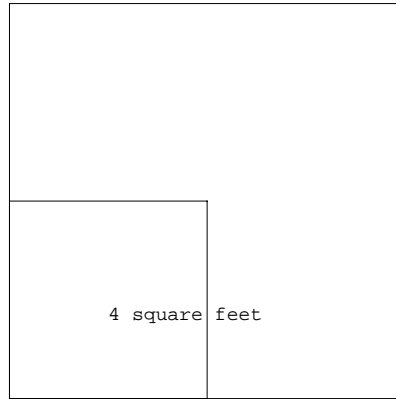


SOCRATES: Now could one draw another figure double the size of this, but similar, that is with all its sides equal like this one?



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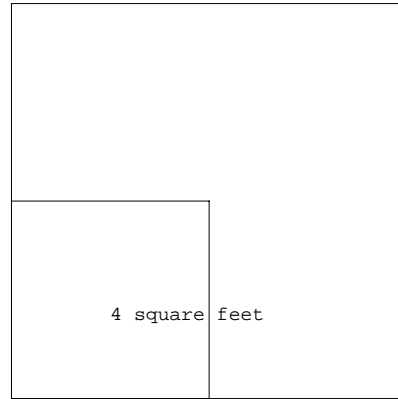
BOY: Yes.



SOCRATES: Now could one draw another figure double the size of this, but similar, that is with all its sides equal like this one?

BOY: Yes.

SOCRATES: How many feet will its area be?

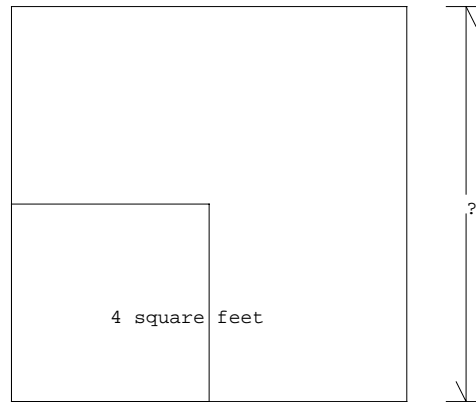


SOCRATES: Now could one draw another figure double the size of this, but similar, that is with all its sides equal like this one?

BOY: Yes.

SOCRATES: How many feet will its area be?

BOY: Eight.



SOCRATES: Now could one draw another figure double the size of this, but similar, that is with all its sides equal like this one?

BOY: Yes.

SOCRATES: How many feet will its area be?

BOY: Eight.

SOCRATES: Now then, try to tell me how long each of its sides will be. The present figure has a side of two feet. What will be the side of the double-sized one?

BOY: It will be double, Socrates, obviously.

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SOCRATES: You see, Meno, that I am not teaching him anything, only asking. Now he thinks he knows the length of the side of the eight-foot square.

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MENO: Yes.

BOY: It will be double, Socrates, obviously.

SOCRATES: You see, Meno, that I am not teaching him anything, only asking. Now he thinks he knows the length of the side of the eight-foot square.

MENO: Yes.

SOCRATES: But does he?

BOY: It will be double, Socrates, obviously.

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MENO: Yes.

SOCRATES: But does he?

MENO: Certainly not.

BOY: It will be double, Socrates, obviously.

SOCRATES: You see, Meno, that I am not teaching him anything, only asking. Now he thinks he knows the length of the side of the eight-foot square.

MENO: Yes.

SOCRATES: But does he?

MENO: Certainly not.

SOCRATES: He thinks it is twice the length of the other.

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MENO: Yes.

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MENO: Yes.

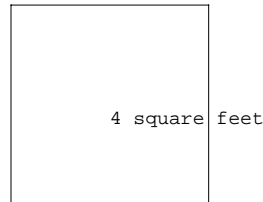
SOCRATES: But does he?

MENO: Certainly not.

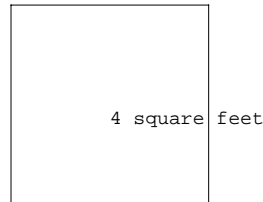
SOCRATES: He thinks it is twice the length of the other.

MENO: Yes.

SOCRATES: Now watch how he recollects things in order -- the proper way to recollect.

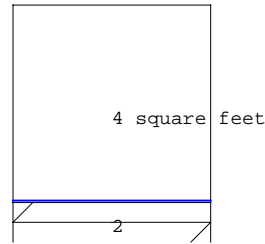


SOCRATES: You say that the side of double length produces the double-sized figure? Like this I mean, not long this way and short that. It must be equal on all sides like the first figure, only twice its size, that is eight feet. Think a moment whether you still expect to get it from doubling the side.



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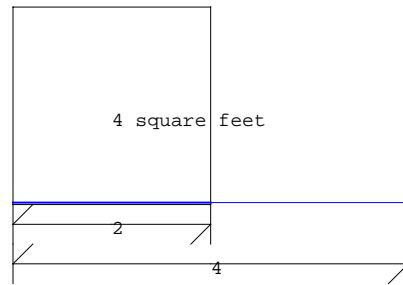
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BOY: Yes, I do.

SOCRATES: Well now, shall we have a line double the length of this

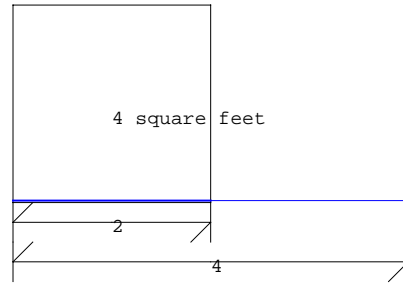


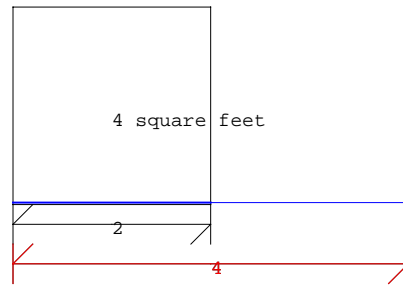
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BOY: Yes, I do.

SOCRATES: Well now, shall we have a line double the length of this if we add another the same length at this end?

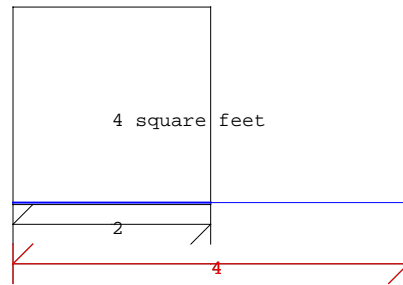
BOY: Yes.





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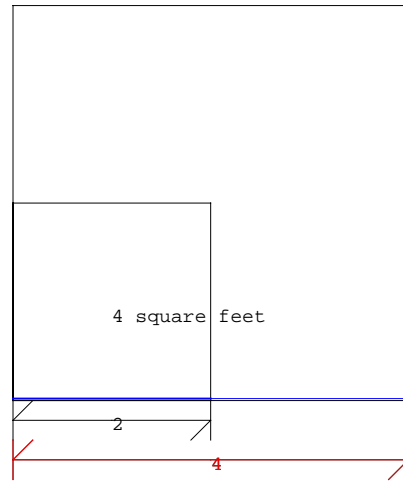
SOCRATES: It is on this line then, according to you, that we shall make the eight-feet square, by taking four of the same length?



BOY: Yes.

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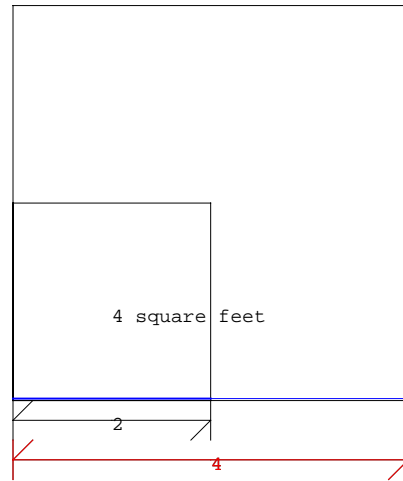


BOY: Yes.

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BOY: Yes.

SOCRATES: Let us draw in four equal lines using the first as a base. Does this not give us what you call the eight-feet figure?



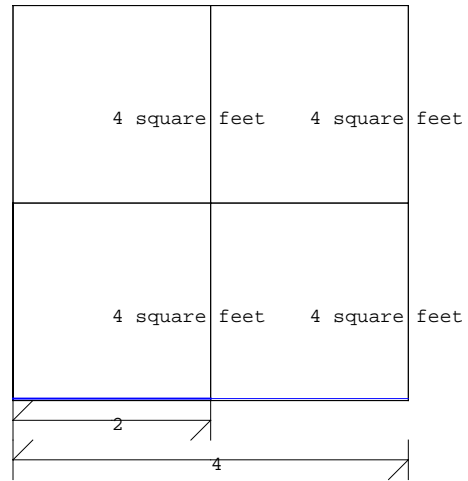
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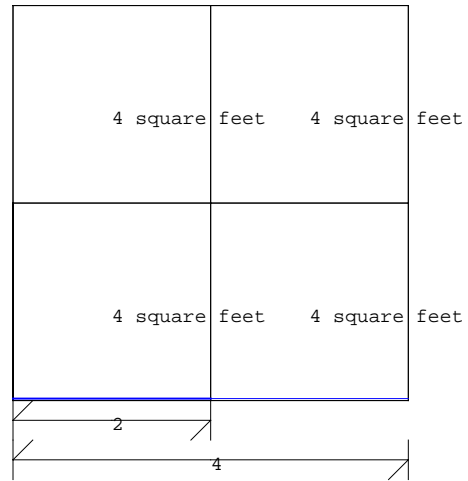
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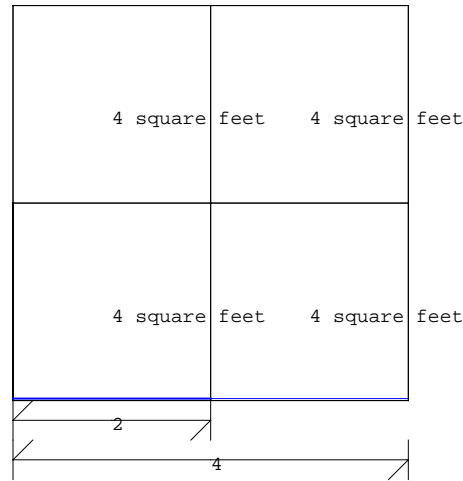


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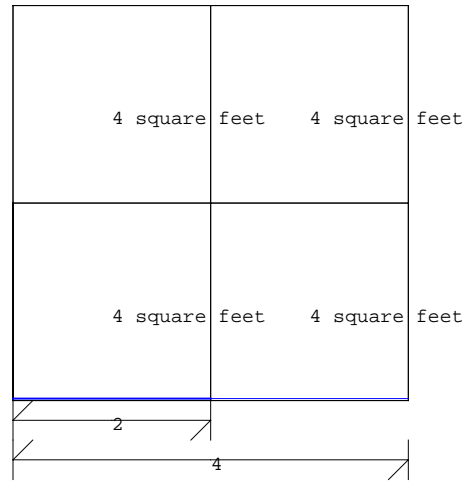
BOY: Yes.



SOCRATES: But does it contain these four squares, each equal to the original four-foot one?

BOY: Yes.

SOCRATES: How big is it then? Won't it be four times as big?

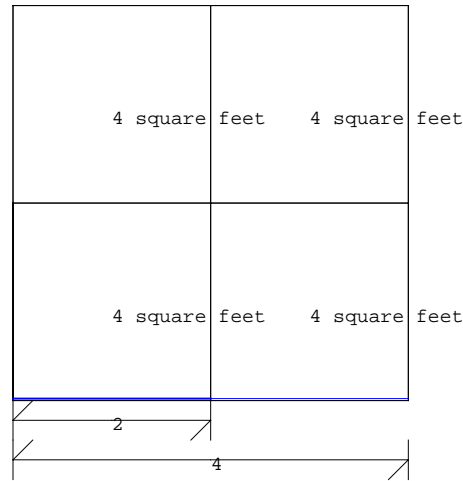


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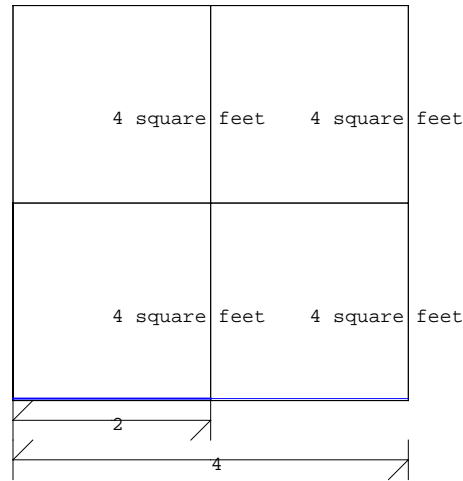
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BOY: Yes.

SOCRATES: How big is it then? Won't it be four times as big?

BOY: Of course.

SOCRATES: And is four times the same as twice?



SOCRATES: But does it contain these four squares, each equal to the original four-foot one?

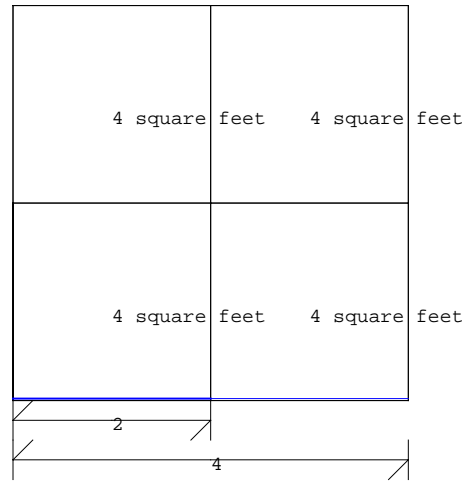
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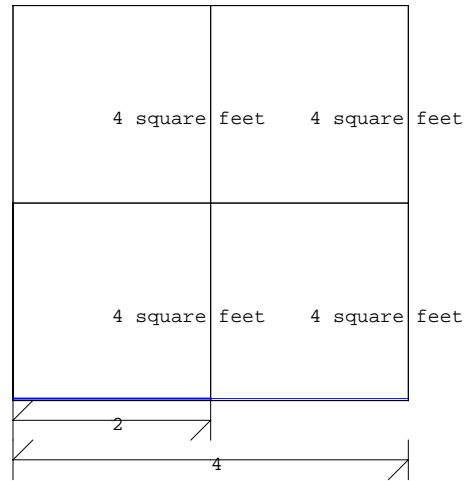
BOY: Of course.

SOCRATES: And is four times the same as twice?

BOY: Of course not.

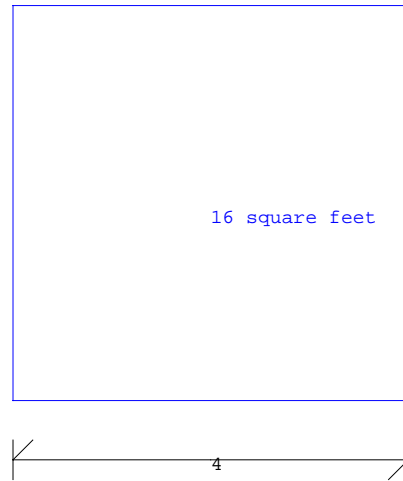


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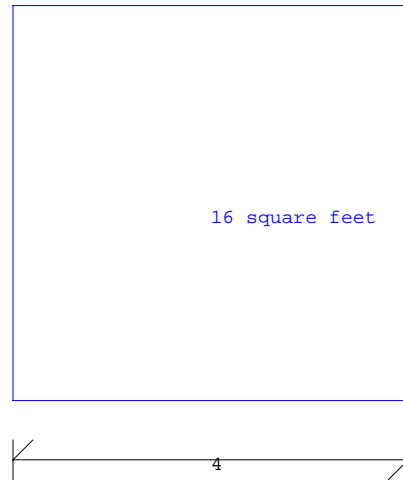
BOY: True.



SOCRATES: So doubling the side has given us not a double but a fourfold figure?

BOY: True.

SOCRATES: And four times four are sixteen, are they not?

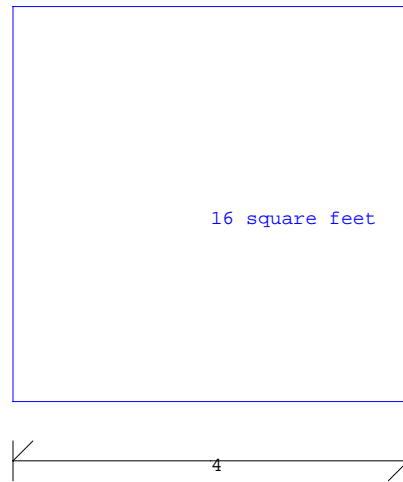


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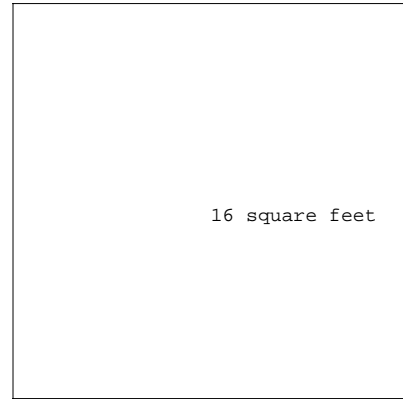
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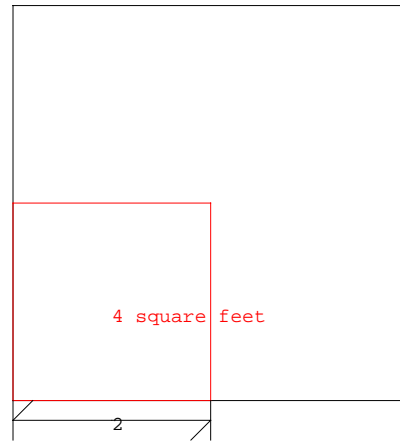
SOCRATES: And four times four are sixteen, are they not?

BOY: Yes.

SOCRATES: Then how big is the side of the eight-feet figure? This one has given us four times the original area, hasn't it?

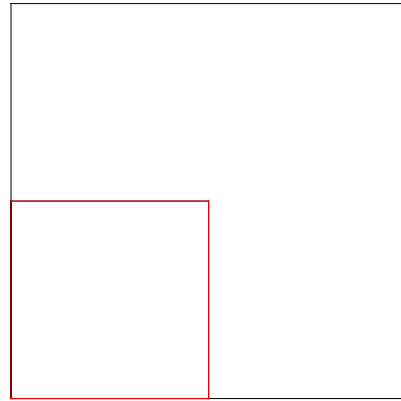


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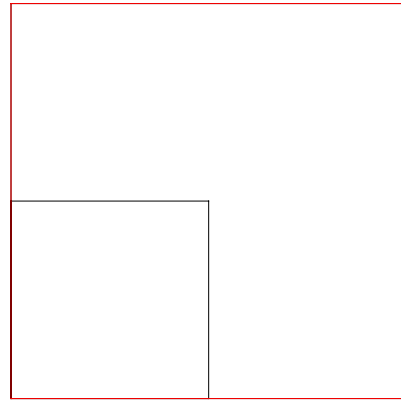
SOCRATES: And a side half the length gave us a square of four feet?



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SOCRATES: And a side half the length gave us a square of four feet?

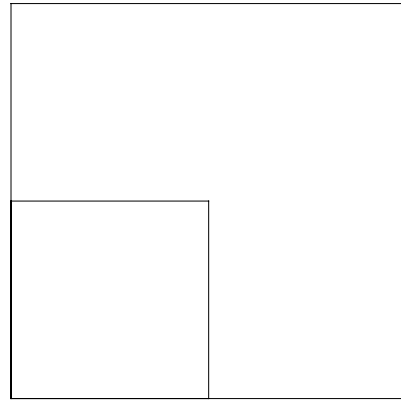
SOCRATES: Good. And isn't a square of eight feet double this one



BOY: Yes.

SOCRATES: And a side half the length gave us a square of four feet?

SOCRATES: Good. And isn't a square of eight feet double this one and half that?

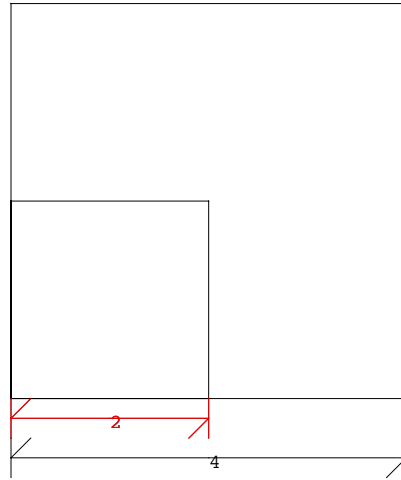


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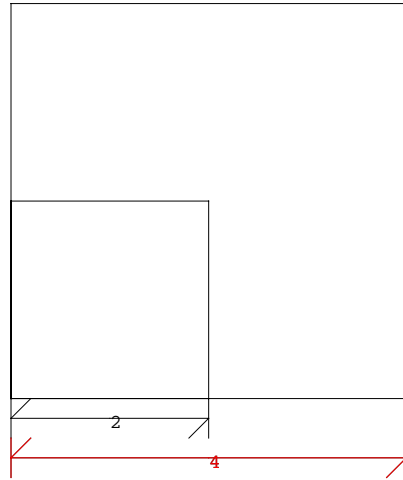
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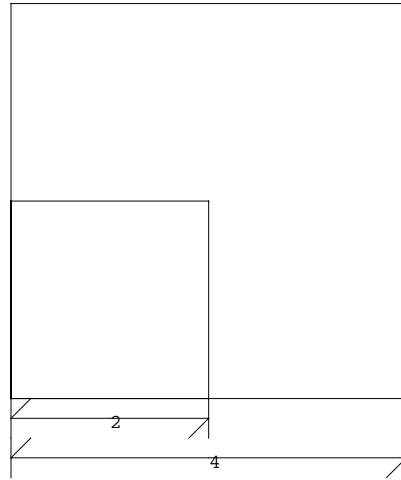
BOY: Yes.



SOCRATES: Will it not have a side greater than this one

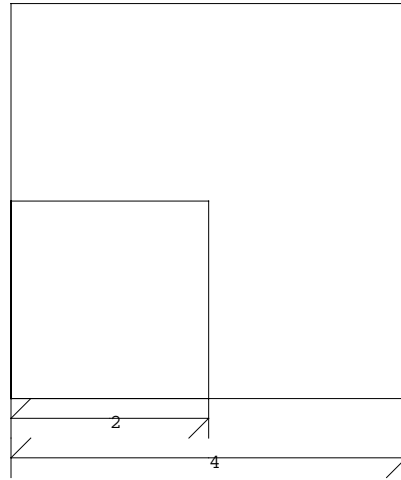


SOCRATES: Will it not have a side greater than this one and less than that?



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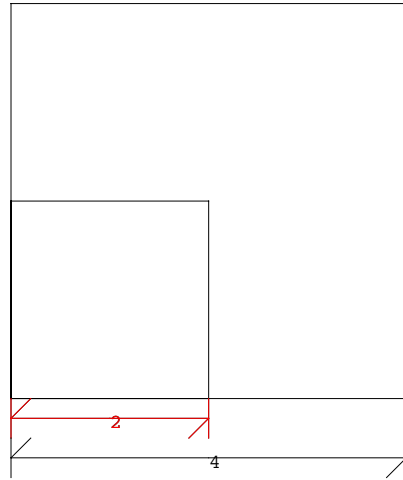
BOY: I think it will.



SOCRATES: Will it not have a side greater than this one and less than that?

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SOCRATES: Right. Always answer what you think.

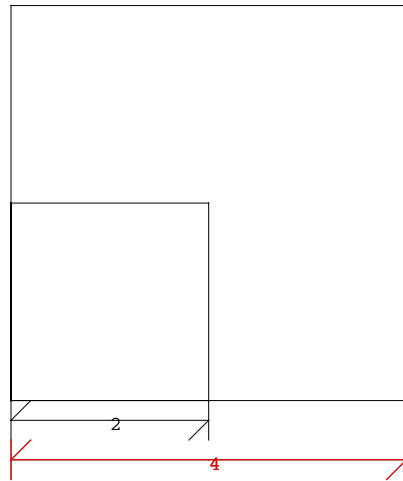


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SOCRATES: Now tell me: was not this side two feet long,

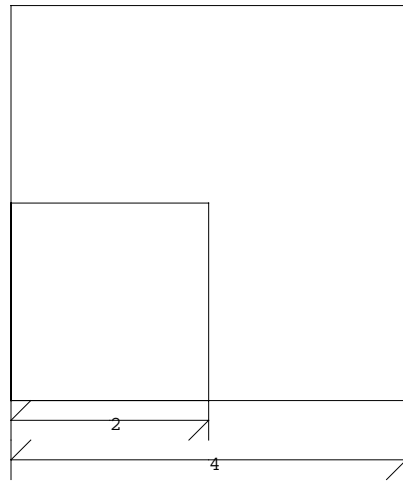


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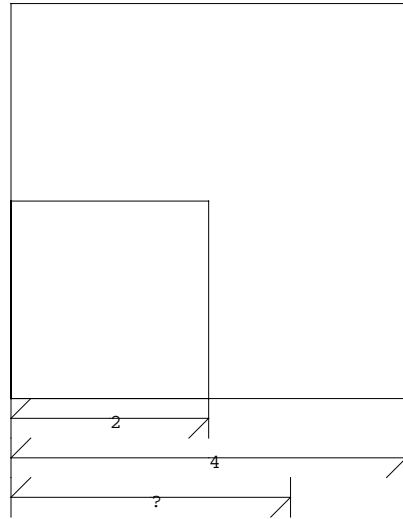
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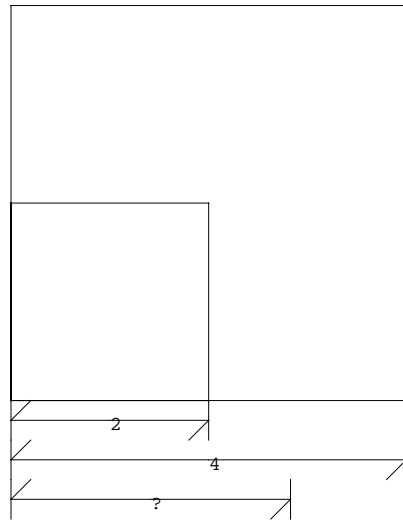
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SOCRATES: Now tell me: was not this side two feet long, and this one four?

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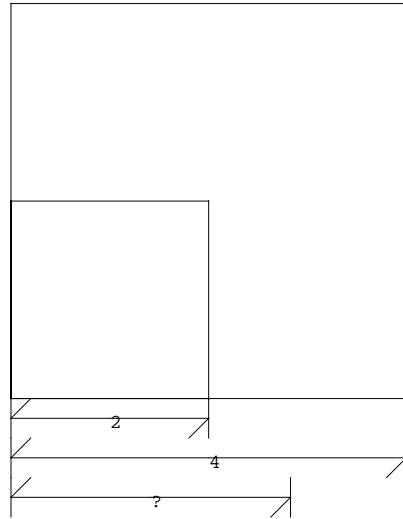


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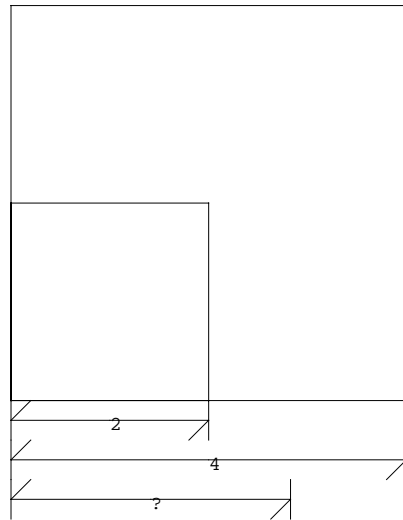
BOY: It must.



SOCRATES: Then the side of the eight-feet figure must be longer than two feet but shorter than four?

BOY: It must.

SOCRATES: Try to say how long you think it is.

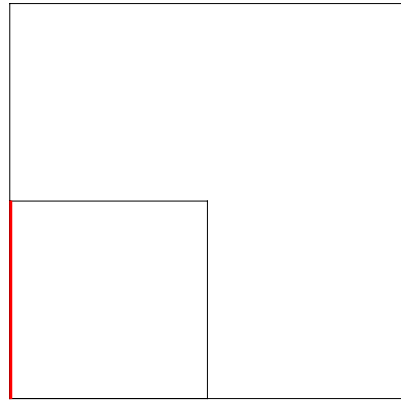


SOCRATES: Then the side of the eight-feet figure must be longer than two feet but shorter than four?

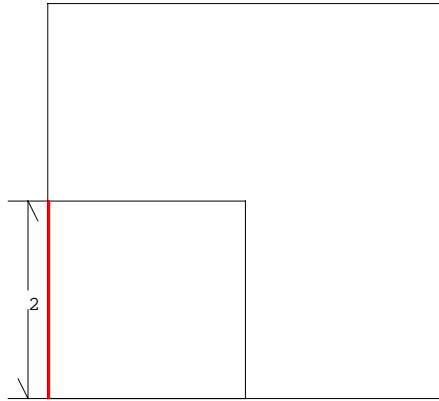
BOY: It must.

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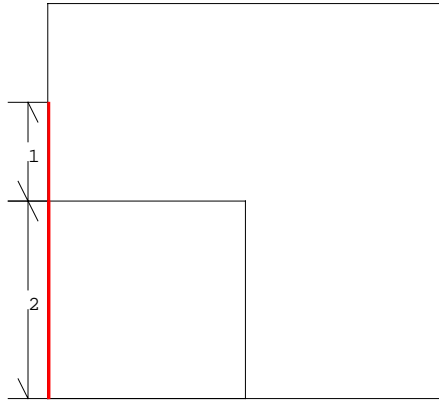
BOY: Three feet.



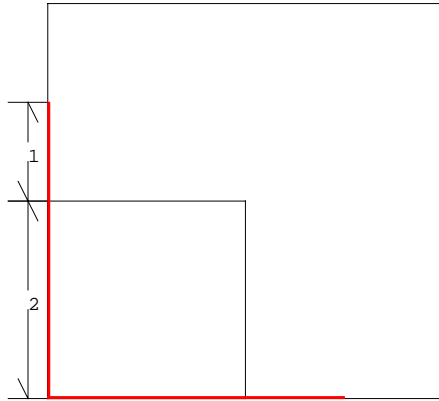
SOCRATES: If so, shall we add half of this bit and make it three feet?



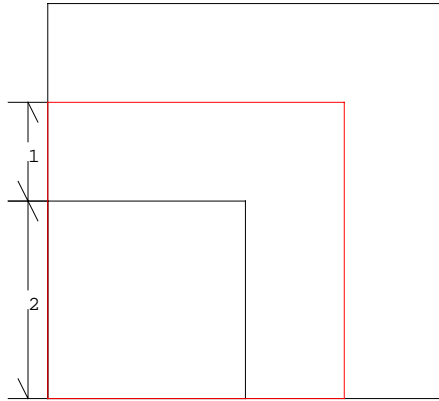
SOCRATES: If so, shall we add half of this bit and make it three feet?
Here are two,



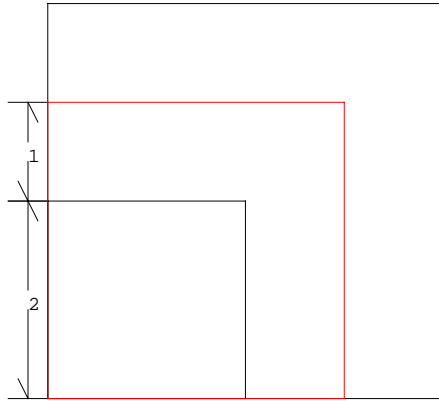
SOCRATES: If so, shall we add half of this bit and make it three feet?
Here are two, and this is one,



SOCRATES: If so, shall we add half of this bit and make it three feet?
Here are two, and this is one,
and on this side similarly we have two plus one;

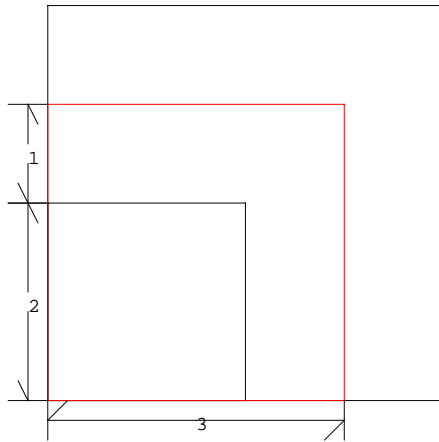


SOCRATES: If so, shall we add half of this bit and make it three feet?
Here are two, and this is one,
and on this side similarly we have two plus one;
and here is the figure you want.



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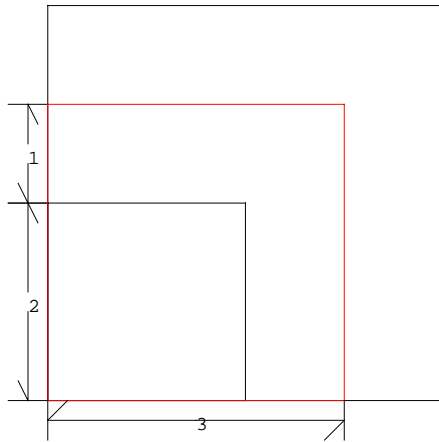
BOY: Yes.



SOCRATES: If so, shall we add half of this bit and make it three feet?
Here are two, and this is one,
and on this side similarly we have two plus one;
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BOY: Yes.

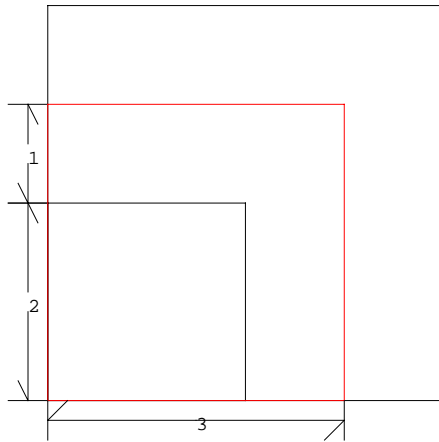
SOCRATES: If it is three feet this way,



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Here are two, and this is one,
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and here is the figure you want.

BOY: Yes.

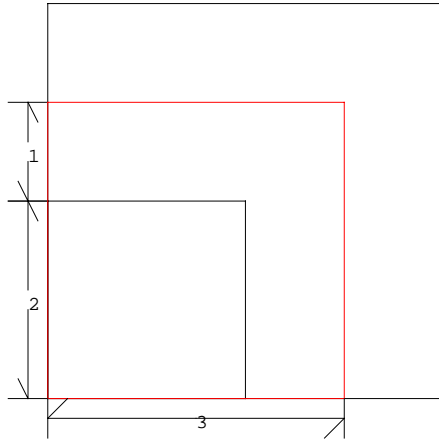
SOCRATES: If it is three feet this way, and three that,



SOCRATES: If so, shall we add half of this bit and make it three feet?
Here are two, and this is one,
and on this side similarly we have two plus one;
and here is the figure you want.

BOY: Yes.

SOCRATES: If it is three feet this way, and three that, will the whole area be three times three feet?



SOCRATES: If so, shall we add half of this bit and make it three feet?
Here are two, and this is one,
and on this side similarly we have two plus one;
and here is the figure you want.

BOY: Yes.

SOCRATES: If it is three feet this way, and three that, will the whole area be three times three feet?

BOY: It looks like it.

SOCRATES: And that is how many?

BOY: Nine.

SOCRATES: Whereas the square double our first square had to be how many?

BOY: Eight.

SOCRATES: But we haven't yet got the square of eight feet even from a three-feet side?

BOY: It's no use, Socrates, I just don't know.

SOCRATES: Observe, Meno, the stage he has reached on the path of recollection. At the beginning he did not know the side of the square of eight feet. Nor indeed does he know it now, but then he thought he knew it and answered boldly, as was appropriate -- he felt no perplexity. Now however he does feel perplexed. Not only does he not know the answer; he doesn't even think he knows.

MENO: Quite true.

SOCRATES: Isn't he in a better position now in relation to what he didn't know?

MENO: I admit that too.

SOCRATES: So in perplexing him and numbing him like the sting-ray, have we done him any harm?

MENO: I think not.

SOCRATES: In fact we have helped him to some extent towards finding out the right answer, for now not only is he ignorant of it but he will be glad to look for it. Up to now, he thought he could speak well and fluently, on many occasions and before large audiences, on the subject of a square double the size of a given square, maintaining that it must have a side of double the length.

MENO: No doubt.

SOCRATES: Do you suppose then that he would have attempted to look for, or learn, what he thought he knew (though he did not), before he was thrown into perplexity, became aware of his ignorance, and felt a desire to know?

MENO: No.

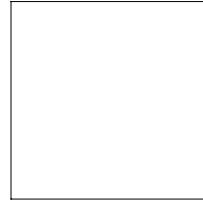
SOCRATES: Then the numbing process was good for him.

MENO: I agree.

SOCRATES: Now notice what, starting from this state of perplexity, he will discover by seeking the truth in company with me, though I simply ask him questions without teaching him. Be ready to catch me if I give him any instruction or explanation instead of simply interrogating him on his own opinions.

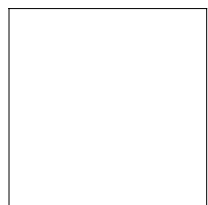


SOCRATES: Tell me, boy, is not this our square of four feet?



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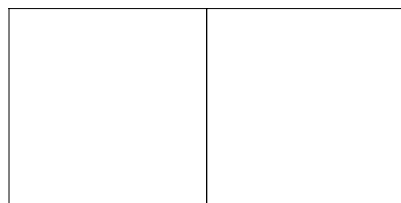
SOCRATES: You understand?



SOCRATES: Tell me, boy, is not this our square of four feet?

SOCRATES: You understand?

BOY: Yes.

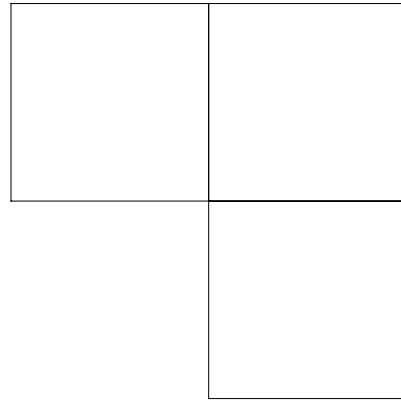


SOCRATES: Tell me, boy, is not this our square of four feet?

SOCRATES: You understand?

BOY: Yes.

SOCRATES: Now we can add another equal to it like this?



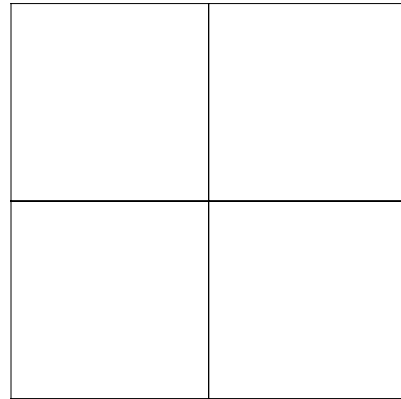
SOCRATES: Tell me, boy, is not this our square of four feet?

SOCRATES: You understand?

BOY: Yes.

SOCRATES: Now we can add another equal to it like this?

SOCRATES: And a third here, equal to each of the others?



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SOCRATES: You understand?

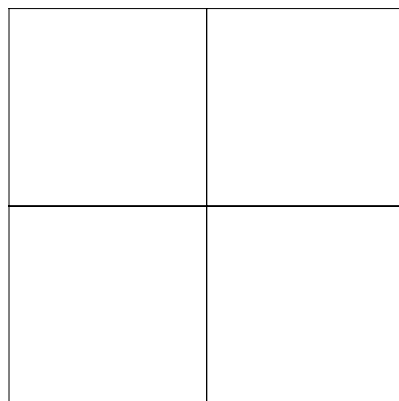
BOY: Yes.

SOCRATES: Now we can add another equal to it like this?

SOCRATES: And a third here, equal to each of the others?

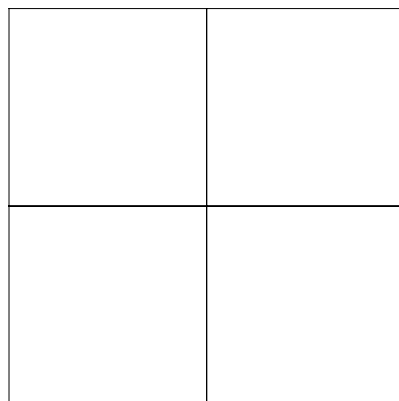
SOCRATES: And then we can fill in this one in the corner?

BOY: Yes.



BOY: Yes.

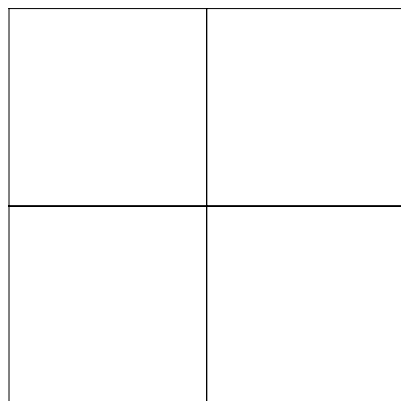
SOCRATES: Then here we have four equal squares?



BOY: Yes.

SOCRATES: Then here we have four equal squares?

BOY: Yes.

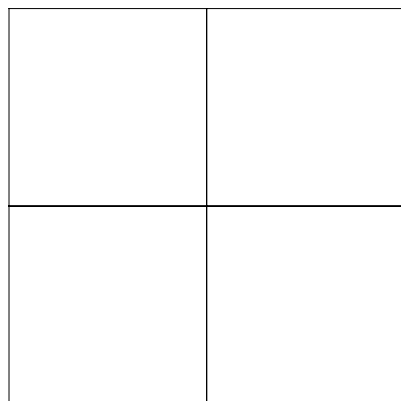


BOY: Yes.

SOCRATES: Then here we have four equal squares?

BOY: Yes.

SOCRATES: And how many times the size of the first square is the whole?



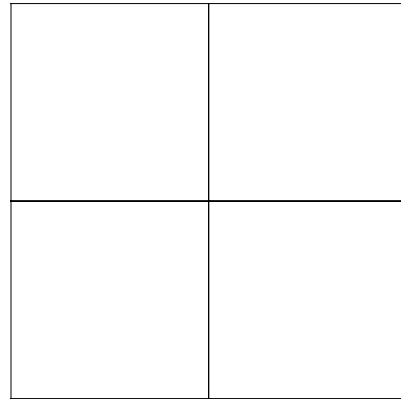
BOY: Yes.

SOCRATES: Then here we have four equal squares?

BOY: Yes.

SOCRATES: And how many times the size of the first square is the whole?

BOY: Four times.



BOY: Yes.

SOCRATES: Then here we have four equal squares?

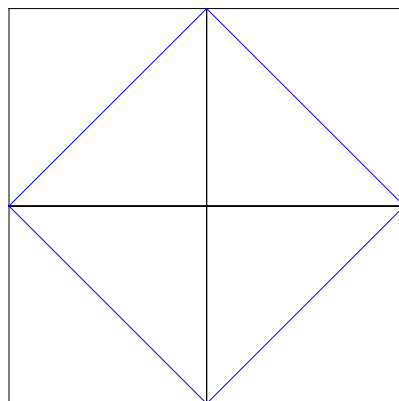
BOY: Yes.

SOCRATES: And how many times the size of the first square is the whole?

BOY: Four times.

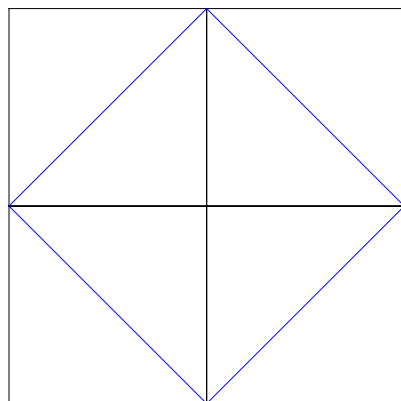
SOCRATES: And we want one double the size. You remember?

BOY: Yes.



BOY: Yes.

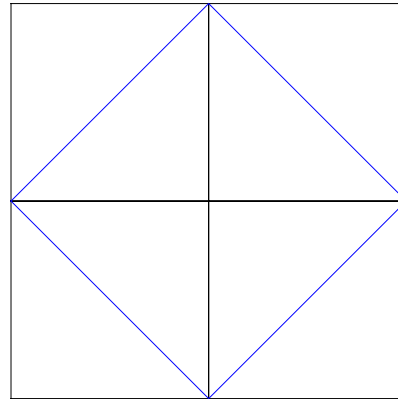
SOCRATES: Now does this line going from corner to corner cut each of these squares in half?



BOY: Yes.

SOCRATES: Now does this line going from corner to corner cut each of these squares in half?

BOY: Yes.

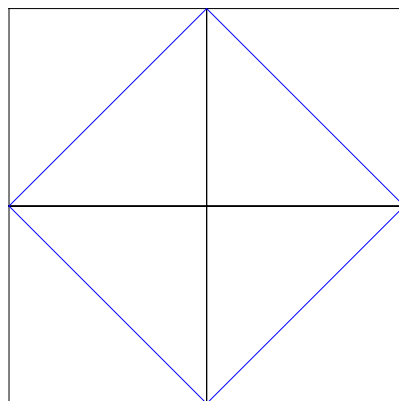


BOY: Yes.

SOCRATES: Now does this line going from corner to corner cut each of these squares in half?

BOY: Yes.

SOCRATES: And these are four equal lines enclosing this area?



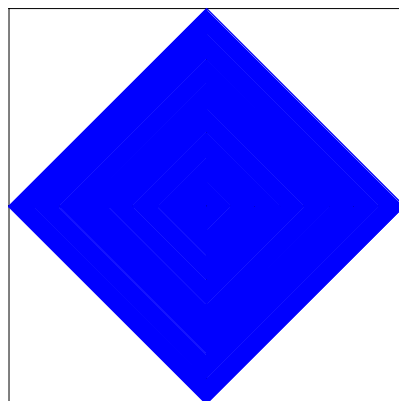
BOY: Yes.

SOCRATES: Now does this line going from corner to corner cut each of these squares in half?

BOY: Yes.

SOCRATES: And these are four equal lines enclosing this area?

BOY: They are.



BOY: Yes.

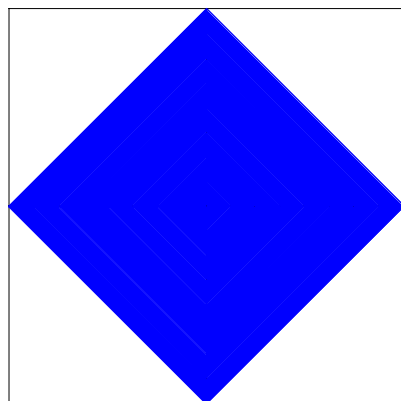
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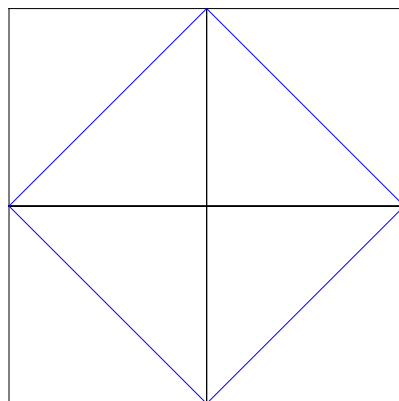
SOCRATES: And these are four equal lines enclosing this area?

BOY: They are.

SOCRATES: Now think. How big is this area?

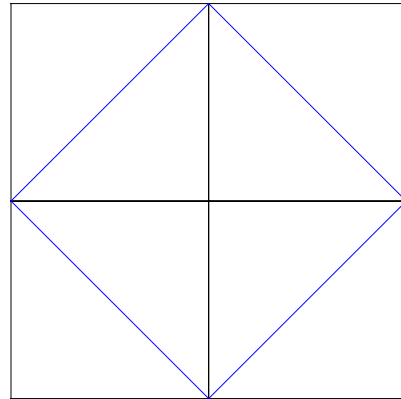


BOY: I don't understand.



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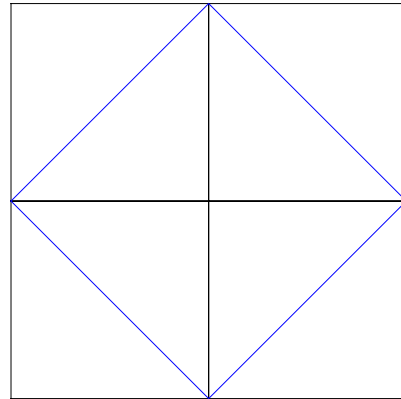
SOCRATES: Here are four squares. Has not each line cut off the inner half of each of them?



BOY: I don't understand.

SOCRATES: Here are four squares. Has not each line cut off the inner half of each of them?

BOY: Yes.

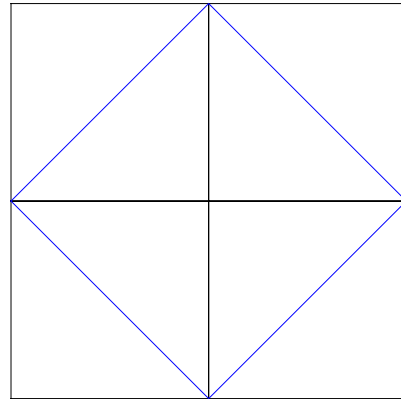


BOY: I don't understand.

SOCRATES: Here are four squares. Has not each line cut off the inner half of each of them?

BOY: Yes.

SOCRATES: And how many halves are there in this figure? (inside the blue diamond)



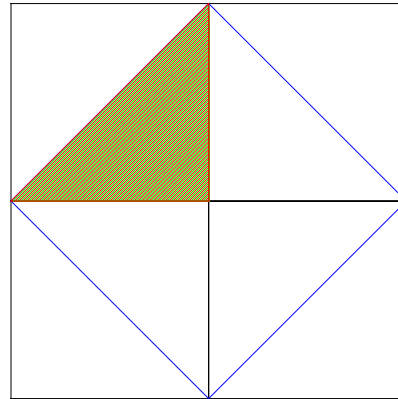
BOY: I don't understand.

SOCRATES: Here are four squares. Has not each line cut off the inner half of each of them?

BOY: Yes.

SOCRATES: And how many halves are there in this figure? (inside the blue diamond)

BOY: Four.



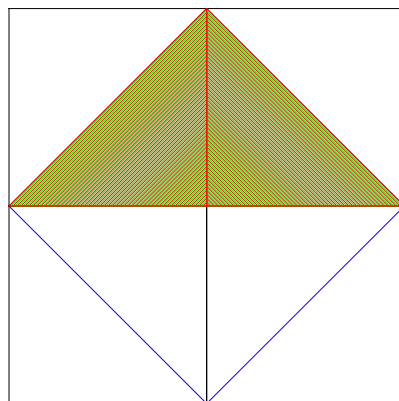
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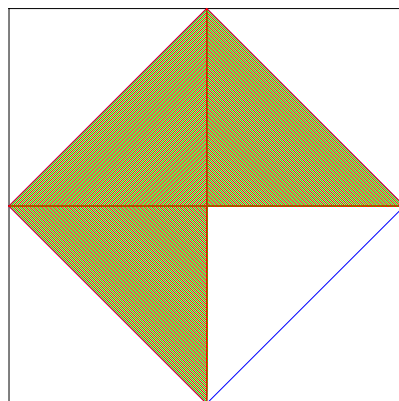
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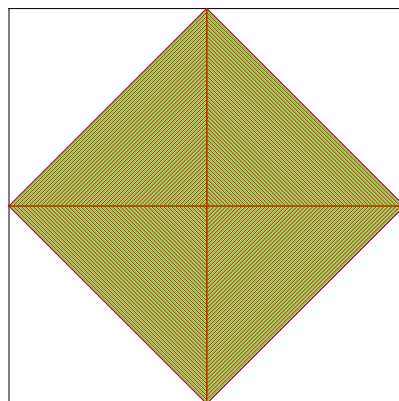
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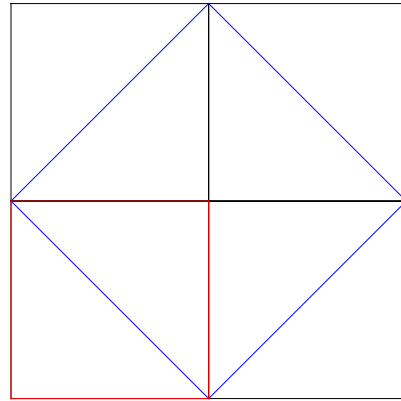
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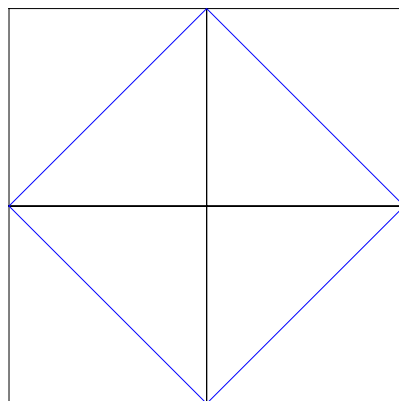
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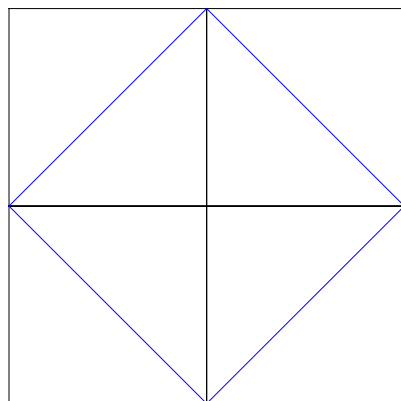


SOCRATES: And how many in this one?



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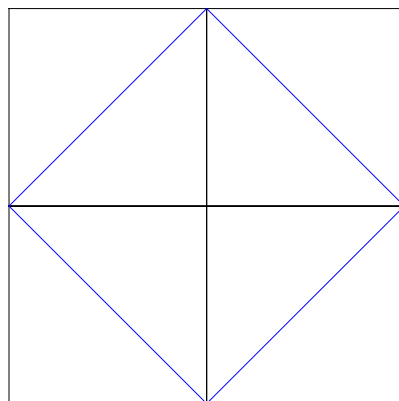
BOY: Two.



SOCRATES: And how many in this one?

BOY: Two.

SOCRATES: And what is the relation of four to two?

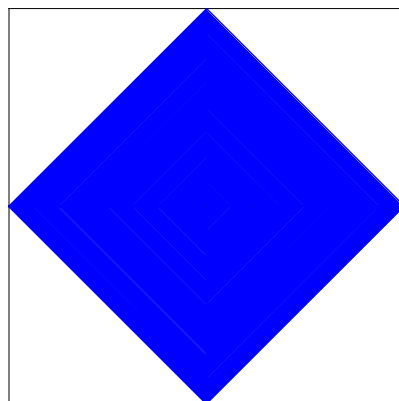


SOCRATES: And how many in this one?

BOY: Two.

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BOY: Double.



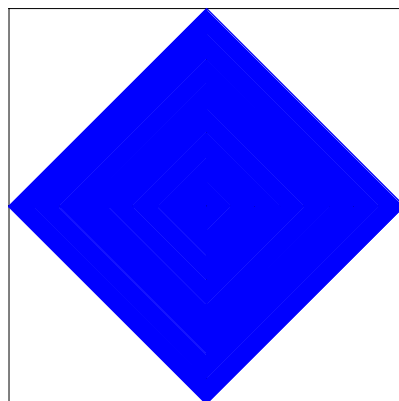
SOCRATES: And how many in this one?

BOY: Two.

SOCRATES: And what is the relation of four to two?

BOY: Double.

SOCRATES: How big is this figure then?



SOCRATES: And how many in this one?

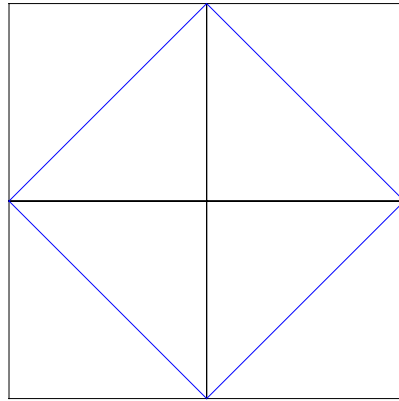
BOY: Two.

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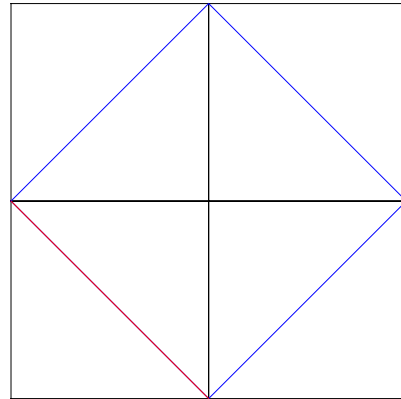
BOY: Double.

SOCRATES: How big is this figure then?

BOY: Eight feet.

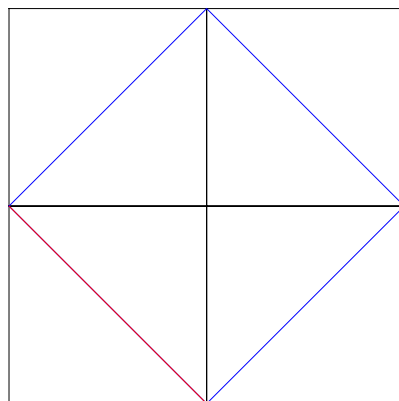


SOCRATES: On what base?



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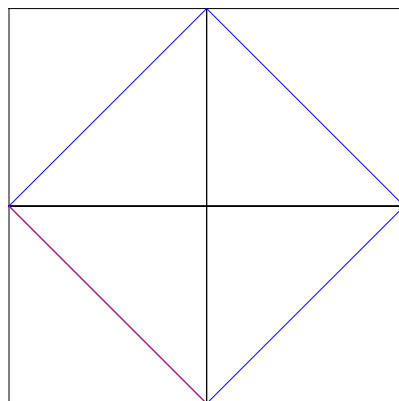
BOY: This one.



SOCRATES: On what base?

BOY: This one.

SOCRATES: The line which goes from corner to corner of the square of four feet?

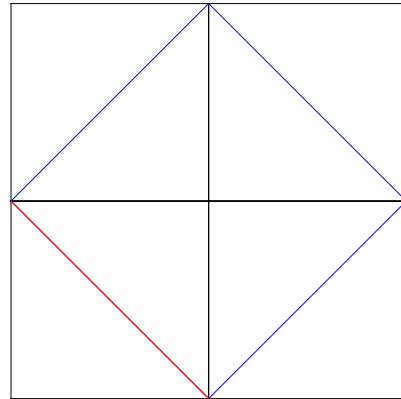


SOCRATES: On what base?

BOY: This one.

SOCRATES: The line which goes from corner to corner of the square of four feet?

BOY: Yes.



SOCRATES: On what base?

BOY: This one.

SOCRATES: The line which goes from corner to corner of the square of four feet?

BOY: Yes.

SOCRATES: The technical name for it is 'diagonal'; so if we use that name, it is your personal opinion that the square on the diagonal of the original square is double its area.

BOY: That is so, Socrates.

SOCRATES: What do you think, Meno? Has he answered with any opinions that were not his own?

MENO: No, they were all his.

THE END

References: Plato's Meno