

Whitebeard's Treasure

PC

3- Read	
1 st :	200 yrs ago; buried treasure the cit 2 fences around - archaeology overall - fences that covers the treasure.
2 nd :	200 yrs old. 1 fence: area 2nd fence: enclosed dig area. } no numbers
3 rd :	How large is the fence ^{joining the enclosed area} to be? What is the ratio of the 1st fence to the 2nd fence around the

Justification

Part 1: Midpoint

i) I found the midpoint of the triangles by using the Pythagorean Theorem. Since I already knew what a & b is in $a^2 + b^2 = c^2$, I plugged the numbers in to try and find a ~~the~~, the c of $a^2 + b^2 = c^2$

I first found how I found c but I divided the answer by 2 to find the midpoint.

Because there are often slope triangles at graphs, you can easily find the $a^2 + b^2 = c^2$ of a triangle, which you can easily find the length of the c of $a^2 + b^2 = c^2$

Part 2: Special Quadrilaterals

4) It's a parallelogram because the sides are parallel. The slopes are the same which result in the lines being parallel. Two lines have the same slope. The slopes are $\frac{2}{5}$ because if you draw the slope triangles, the $\frac{\text{rise}}{\text{run}}$ is $\frac{2}{5} = \frac{5}{2}$

Whitebeard's Treasure

3- Read

1st: Pirate buried treasure. Fence was made around the area to separate the mad and archaeologist

2nd: 2 fences. 1 fence around dig area. Another one around the archaeologist location

3rd: What's the shape of two fences? What is the area inside the fences. What is the perimeter of the two fences. What are the ratios of the perimeter and areas.

Justification

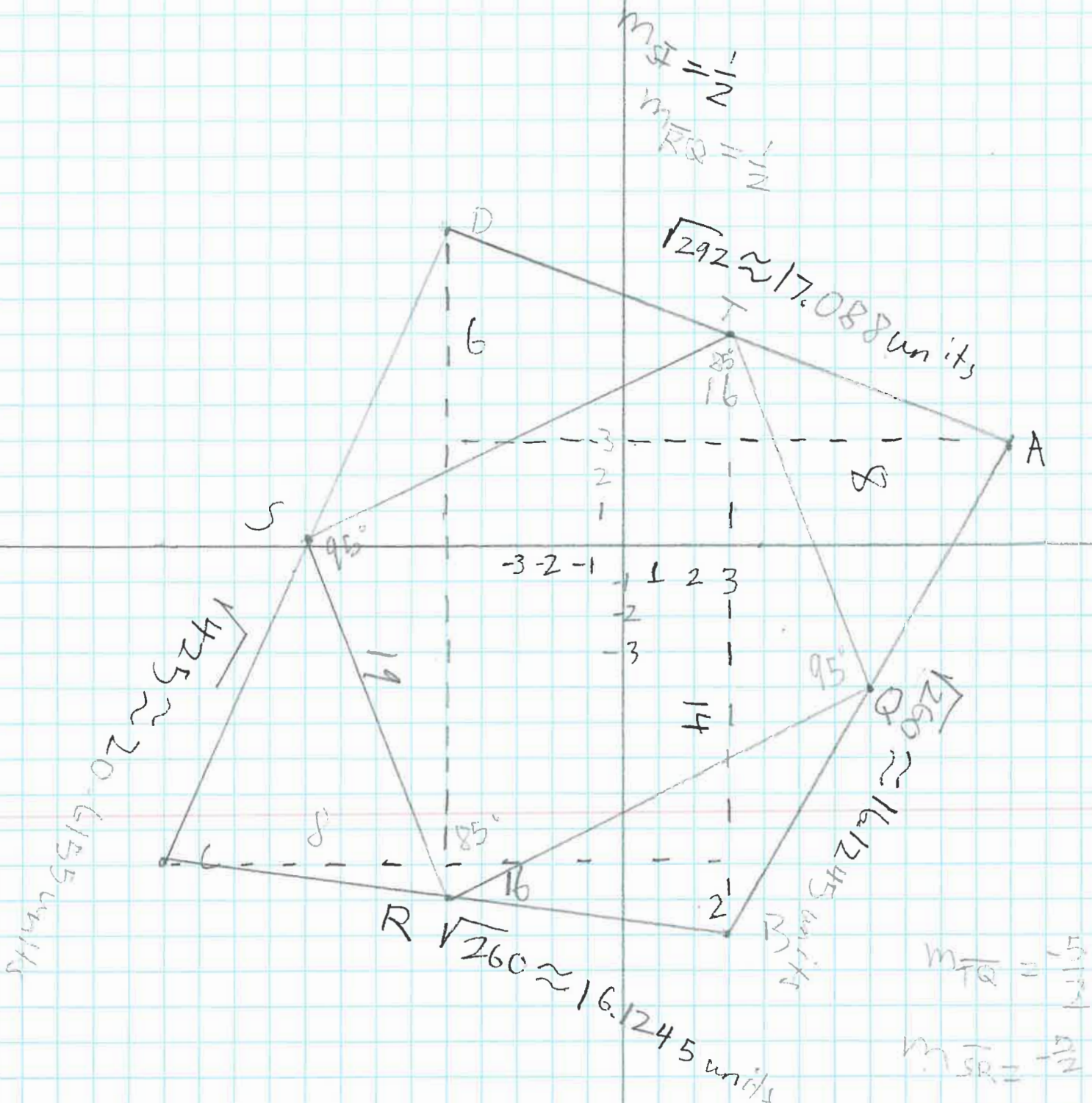
Part 1: Midpoint

To find the midpoints, I first found the slope triangle of each line (rise and run) then used the pythagorean theorem ($a^2 + b^2 = c^2$) to find the length of each line segment. After that was found, I divided that value by 2 to find the distance the midpoint is from the letter points. To plot down the midpoint I converted each unit on the graph to inches (1 unit = $\frac{1}{4}$ inch) and used a ruler to plot it down.

Part 2: Special Quadrilaterals

I think it's a parallelogram. The slope triangles for every side is the same as the opposite side's slope triangle. I also used a protractor. The opposite sides were similar. The slopes

What was the slope?
3



Whitebeard's Treasure

12/7/18 Geometry 10

3- Read	
1 st :	Treasure on Tiki Island - 2 fences so Archeologists and media can be happy.
2 nd :	200 yrs ago, 1 fence edges oreo they'll work, other fence will enclose dig site
3 rd :	How long ago was the treasure buried? If the media didn't want to cover the dig site, how many fences would you need?

Justification

Part 1: Midpoint

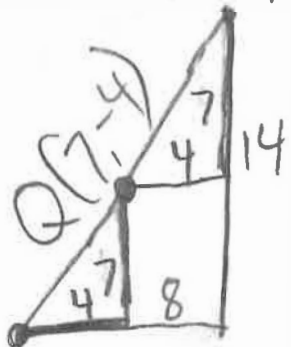
I think the midpoints that I found are the correct midpoints because

if you find out how many units apart are the points you divide the total rise and total run and use the smaller slope triangles to get your midpoint.

By what number?

A (11, 3)

(By counting out the distance or by subtraction)



$$14 \div 2 = 7 \quad 11 - 4 = 7$$

$$8 \div 2 = 4 \quad 3 - 7 = -4$$

I use Pythagorean Theorem and divided hypotenuse by 2.

Part 2: Special Quadrilaterals

The lines \overline{JT} and \overline{RQ} have a slope of $\frac{1}{2}$

The lines \overline{TQ} and \overline{SR} have a slope of $-\frac{5}{2}$. For the lines to be perpendicular to form a 90° angle, the slope of \overline{JT} ($\frac{1}{2}$) must be flipped over and become negative, like $-\frac{2}{1}$. The slope of \overline{TQ} and \overline{SR} have to be -2 so that the figure is a rectangle. Since it's not, but the figure does have 2 sets of parallel lines, it can be called a

Parallelogram.

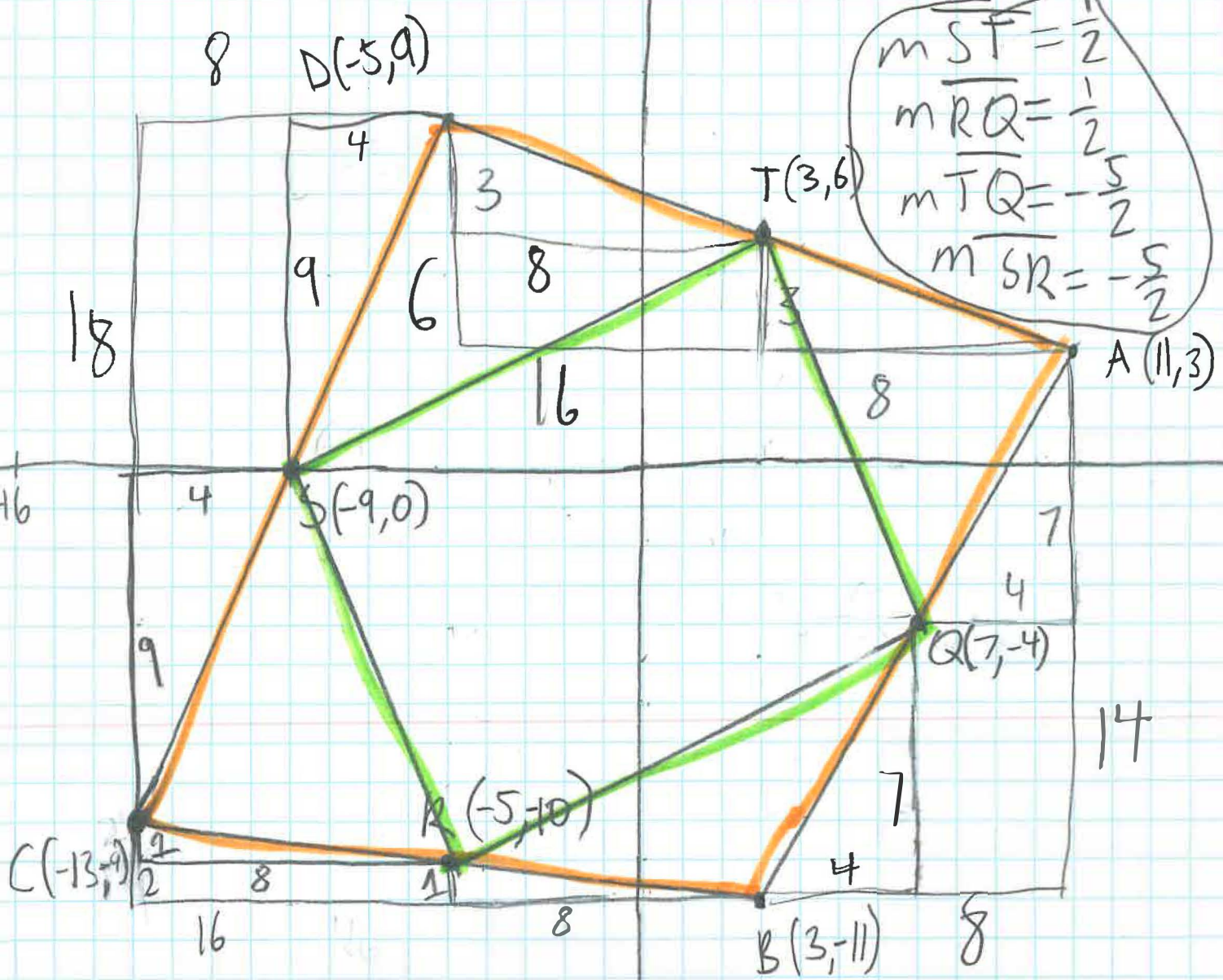
22

~~SR = A~~

$$\cancel{SF = \frac{6-0}{3+9} = \frac{6}{12} = \frac{1}{2}}$$

$$y = \frac{1}{2}x + 4.5$$

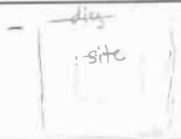
$m_{ST} = \frac{1}{2}$
 $m_{RQ} = \frac{1}{2}$
 $m_{TQ} = -\frac{5}{2}$
 $m_{SR} = -\frac{5}{2}$



~~$$RQ = \frac{-10+4}{-5-7} = \frac{6}{-12} = \frac{1}{2}$$~~

20

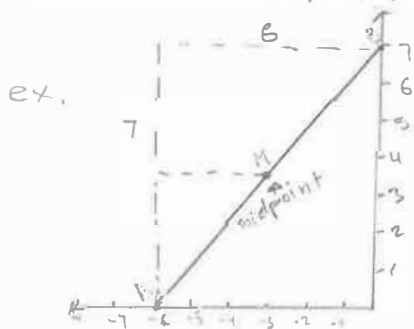
Whitebeard's Treasure

3- Read	
1 st : treasure on Tikk island 200 years ago - map found - 2 fences around location - 1 around site & 1 around dig	
2 nd : - 200+ years ago	
3 rd : - If the archaeologists' fence is 20ft by 50ft and the medic's fence is 10ft away on all sides, what are the dimensions of the medic's fence? -	

Justification

Part 1: Midpoint

I found the midpoint of each line by cutting their slope triangles in half. The slope triangle is used with the y-intercept to find points on lines. If you want to cut a line in half and find its own slope triangle, you multiply the slope by $\frac{1}{2}$. It gives you the same slope, just makes the line 50% shorter. This is how I found the points: Q(7, -4), R(5, -10), S(-9, 0), and T(3, 6).

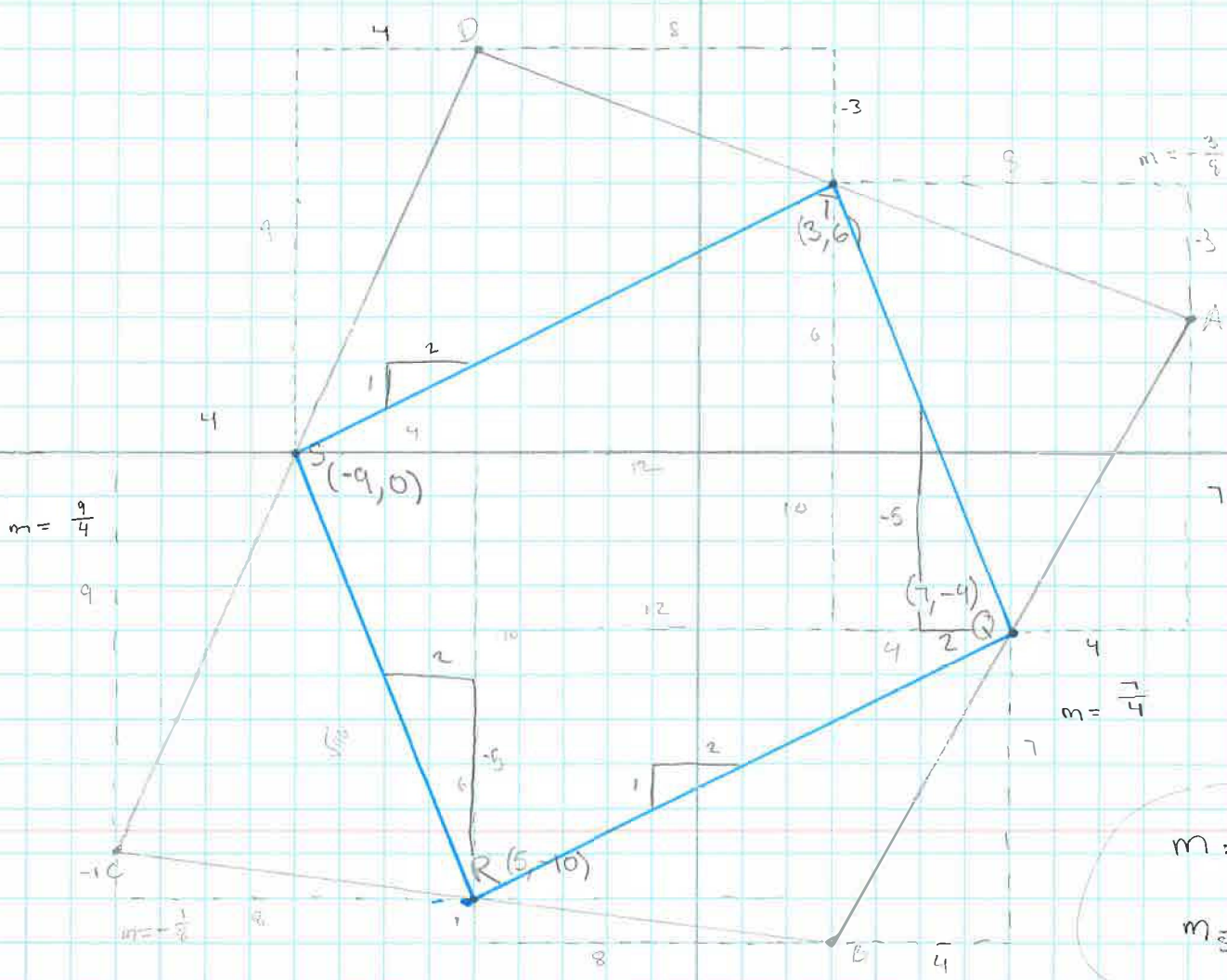


Part 2: Special Quadrilaterals

This is a parallelogram, when you use slopes, the two opposite sides have the same slope. But, the slopes of touching lines aren't perpendicular meaning they don't form a 90° angle. Therefore, the shape isn't a rectangle like it seems but a parallelogram.

$$m_{ST} = \frac{1}{2}$$

$$m_{RO} = \frac{1}{2}$$



$$m_{PQ} = -\frac{2}{5}$$

$$m_{SR} = -\frac{2}{5}$$

Whitebeard's Treasure

3- Read
1 st : Some pirate dude buried treasure 200 years ago, and then found a map that led to it
2 nd : 2 fences 1 fence → area where archeologists work 1 fence → so media can still access it
3 rd :

Justification

Part 1: Midpoint

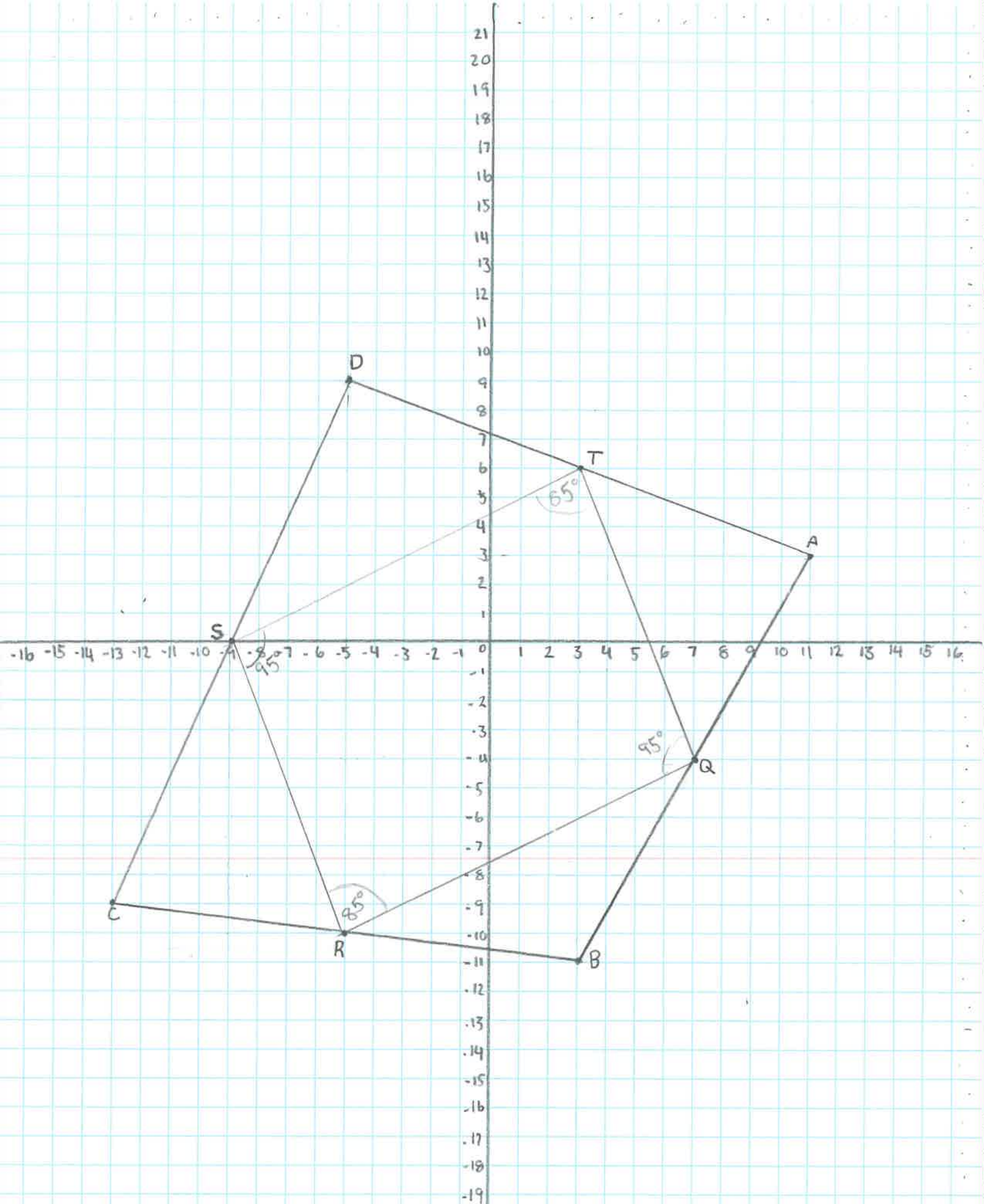
I found the midpoints with my amazing method. I measured the line segments, knowing how each unit is exactly a $\frac{1}{4}$ inch. After finding the lengths, you can divide them by 2, and plot it on the graph.

(not really)

Part 2: Special Quadrilaterals

I ^{know} ~~think~~ that it is a parallelogram because the opposite angles are congruent, so therefore the opposite sides are parallel.

Justify how
opposite angles
are \cong 3



Whitebeard's Treasure

3- Read

1st: Whitebeard buried treasure on Tiki Island. Archeologists found where treasure is, but now the media wants to see it so they are going to build fences around the dig site.

2nd: Buried treasure 200 years ago, 2 fences built, one around the archeologists' work area and one around the dig site.

3rd: What is the area of the dig site inside the fence? What is the area of the work site inside the fence? What is the length of the dig site fence? What is the length of the work area fence?

Justification

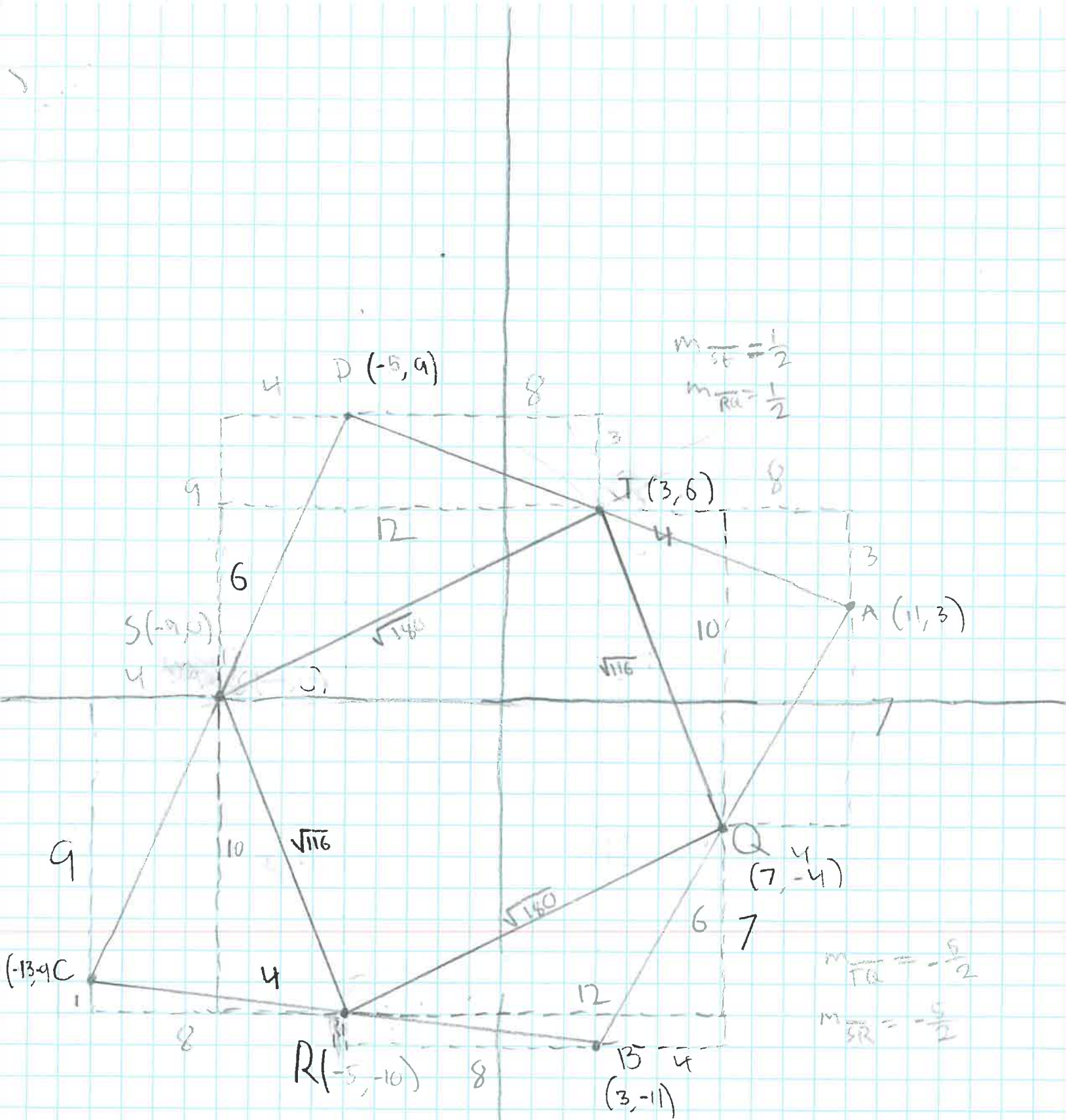
Part 1: Midpoint

I think that midpoints $Q(7, -4)$, $R(-5, 10)$, $S(-4, 0)$, and $T(5, 6)$ are all on these points because I used two equal slope triangles to find them. Since both slope triangles are equal and they both fit on the same line, that means that one hypotenuse is half the length of the line. Since the midpoint is in the middle of the line, that means the midpoint is always at the point where both triangles meet in the center on one point.

Part 2: Special Quadrilaterals

Quadrilateral $QRST$ is a parallelogram. I know this because sides \overline{RQ} and \overline{ST} are parallel and are the same length and sides \overline{RS} and \overline{QT} are also parallel and are the same length. However, \overline{ST} and \overline{QT} and \overline{RS} and \overline{ST} are not perpendicular because their slopes aren't perpendicular, so the shape cannot be a rectangle so it must be a parallelogram.

which means that it could be a rectangle or a parallelogram.



Whitebeard's Treasure

3- Read
1 st : Archaeologist and median coexisting to site with 2 fences:
2 nd : 1 fence area 1 for digging
3 rd : How many times bigger is the first fence compared to the second fence

Justification

Part 1: Midpoint

To find the midpoint, I made a slope triangle to find the length and height of it. Then I used the Pythagorean Theorem to find the length of the hypotenuse, with the length determined

$$\text{Mid of } \overline{CD} = (-9, 10)$$

$$\text{Mid of } \overline{AD} = (3, 6)$$

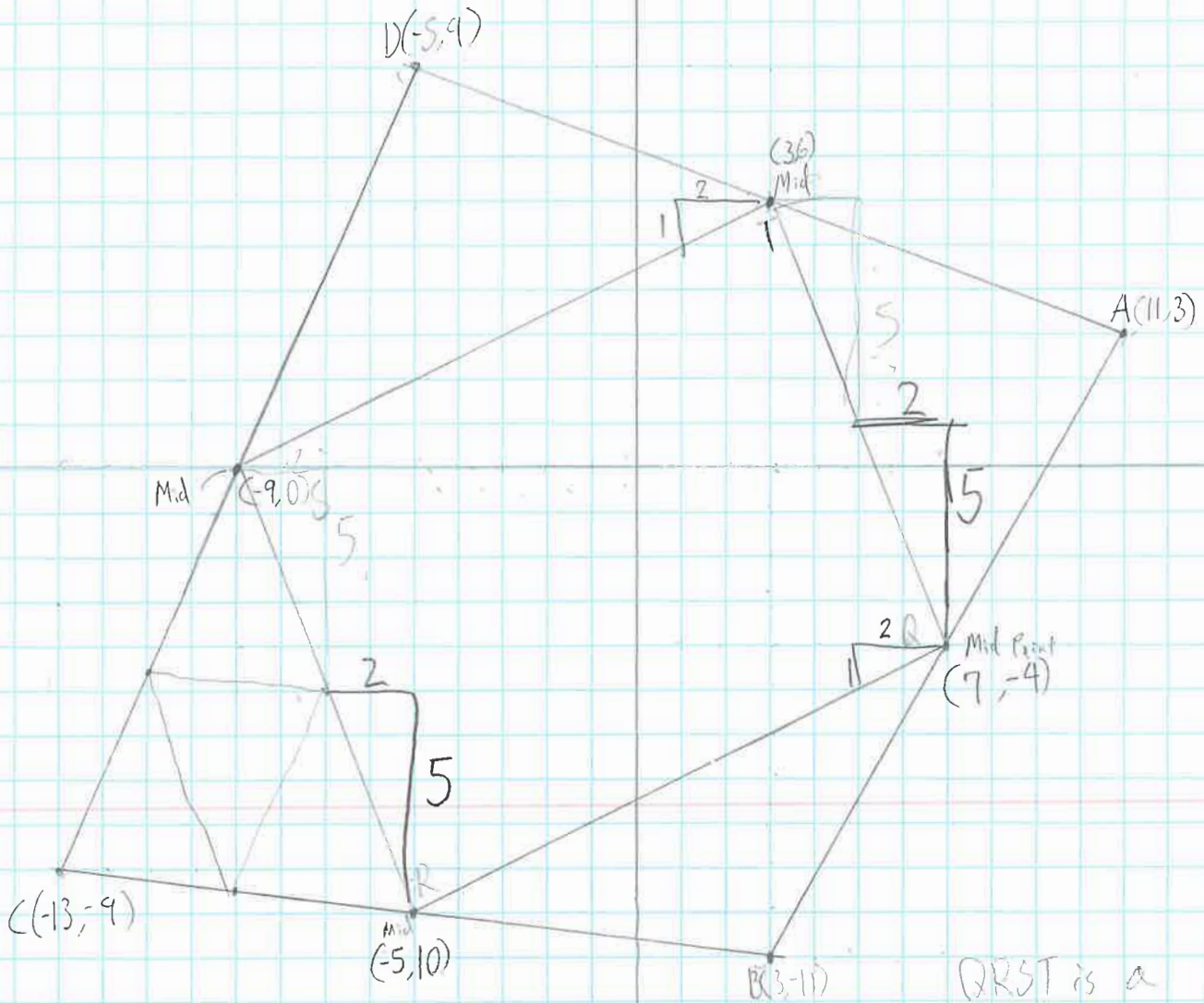
$$\text{Mid of } \overline{AB} = (7, -4)$$

$$\text{Mid of } \overline{BC} =$$

Part 2: Special Quadrilaterals

4) The square QRST is a parallelogram because $\overline{QT} \parallel \overline{SR}$ with a slope of ~~1/2~~ $-\frac{1}{2}$

Trapezoid?
What about other sides?
3



QRST is a parallelogram because $\overline{QT} \parallel \overline{RS}$ with a slope of $-\frac{3}{8}$.

Whitebeard's Treasure

3- Read
1 st : Treasure get fence
2 nd : 2 fences
3 rd : assuming the larger square is 12 ft on a side what is difference in area of square

Justification

Part 1: Midpoint

you find the mid points by first drawing a slope triangle. then you use pythagorean theorem to find line. Measure your units and divide the answer by two and graph using ruler according to how many units.

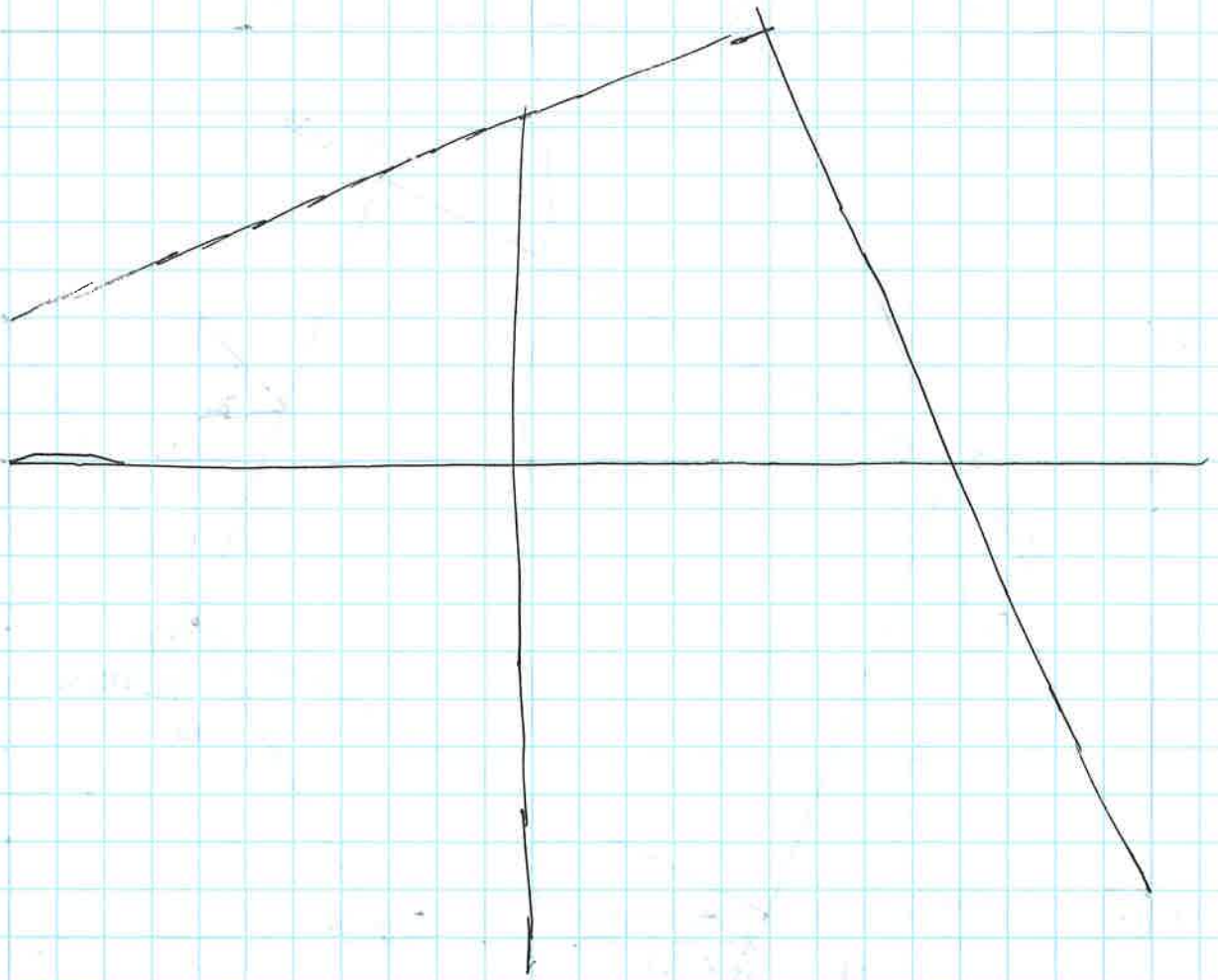
It's a parallelogram.

Write as a ratio

Part 2: Special Quadrilaterals

both have a $2/5$ slope and so lines are parallel
 $\overline{QT} \parallel \overline{RS}$ so its equal

What about other sides?



Whitebeard's Treasure

whit beard = pirate	3- Read
1 st : White beard buried treasure. Scientist located the location. The media and scientist work together. They are putting fences up so that each have a separate space to work in. 2 fences	
2 nd : -2 fences: $\frac{1}{\text{allows scientist to work}}$ $\frac{2}{\text{allows media to work}}$	buried over 200 years ago.
3 rd : How big is the fence? What's the distance between the two fences? What's the difference of the two fences? What is the ratio?	

Justification

Part 1: Midpoint

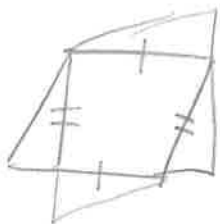
My strategy was I would find the slope of each side, and used the lengths to find the midpoint of every letter. I used Pythagorean theorem to find each unknown length. After doing so I divided that by two to find the midpoint (the middle). To find it in inches I divided it by 4 since inches were $\frac{1}{4}$ of the units. This strategy makes it more accurate.

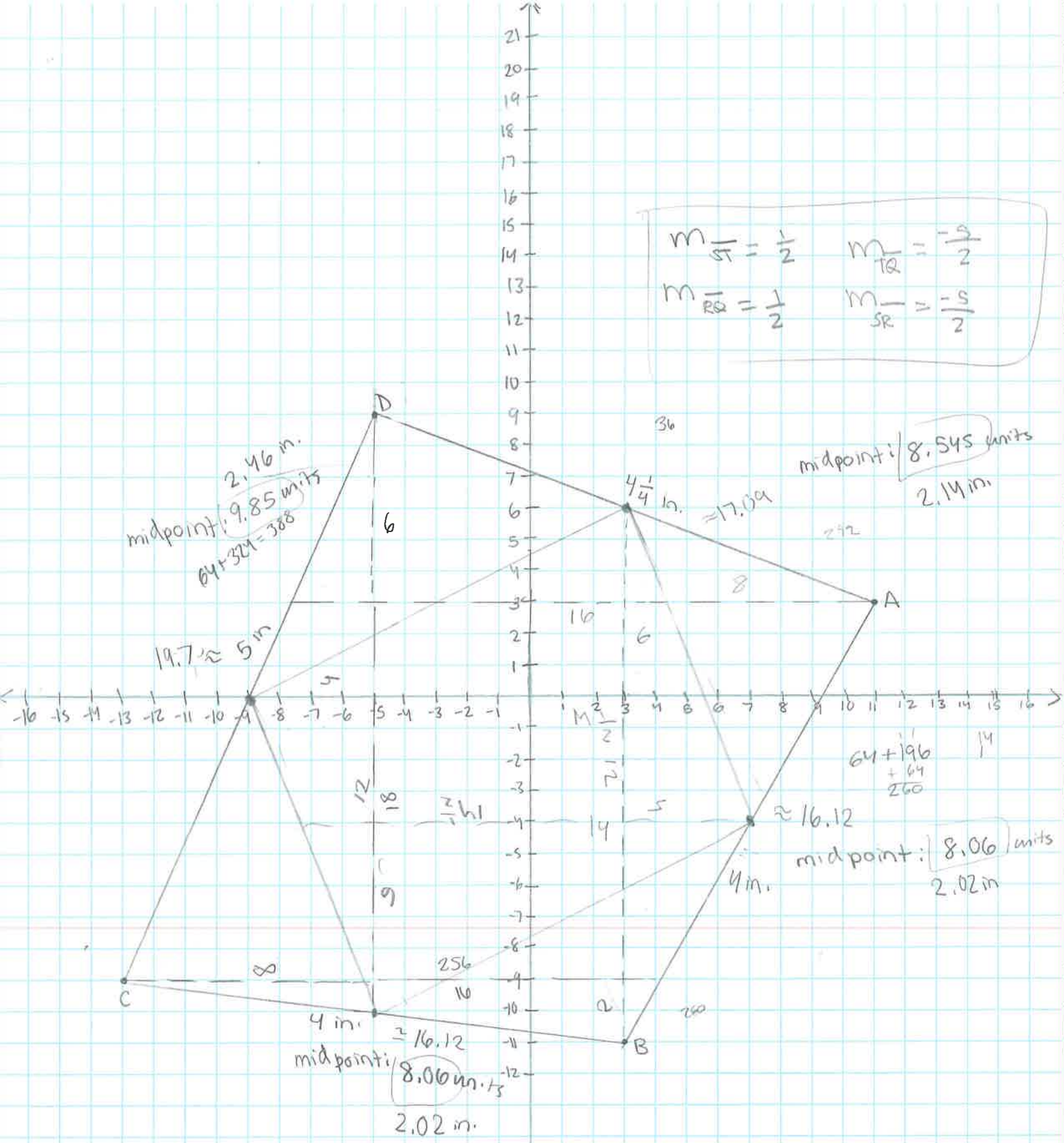
Part 2: Special Quadrilaterals

It's a parallelogram because when measuring the angles of the figure, you get, that the opposite angles are congruent.




Another strategy is to calculate the slope of the lines of the QRST figure and find that the opposite sides have the same slope.





Whitebeard's Treasure

3- Read	
1st:	 <p>2 fences = dig site and camera site pirate treasure</p>
2nd:	<p>200 yrs ago 2 fences around the treasure</p>
3rd:	<p>How big is the dig area? what shape is the fence?</p>

Justification

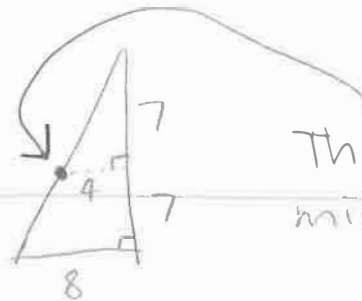
Part 1: Midpoint

To find the Midpoint, create a slope triangle.

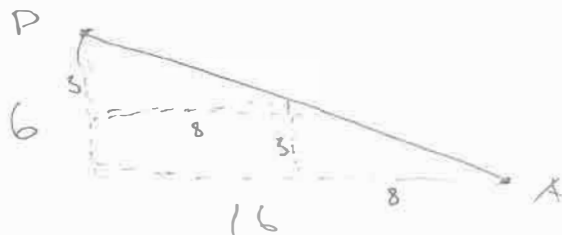


Then, divide the side

lengths by 2



This is the midpoint.

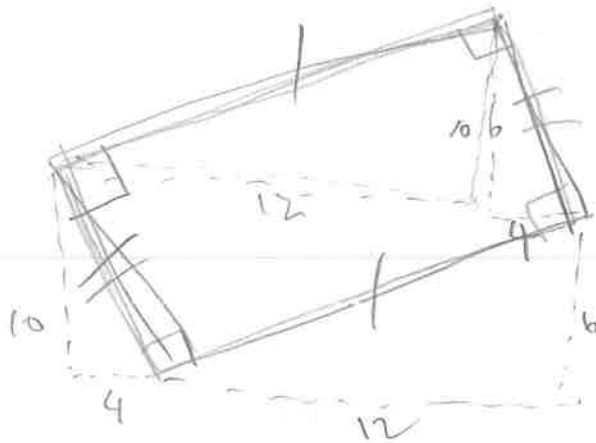


$$\frac{6}{16} = \frac{3}{8}$$

Part 2: Special Quadrilaterals

□ QRST

~~rectangle~~ / parallelogram, 2 pairs equal sides.



2 pairs lines w/ same slope

Show how you
got slope?
3

Whitebeard's Treasure

3- Read

1st: is pirate buried treasure found treasure
 2 fences soldier work

2nd: 20 years ago with archaeologist 2 fences
 1 archaeologist site
 1 area to find it

3rd: if the treasure gets buried 3 centimeters in the ground every year started 10 centimeters in the ground.

The archaeologist dig at a rate of 7.5 cm ^{amount} how long does it take for them to reach the treasure

Justification

Part 1: Midpoint

The midpoints $P(3, 6)$ $Q(7, -4)$

$R(-5, -10)$ and $S(-9, 0)$ I got these

answers by drawing slope triangle



on the line the divided

are similar by 2 so

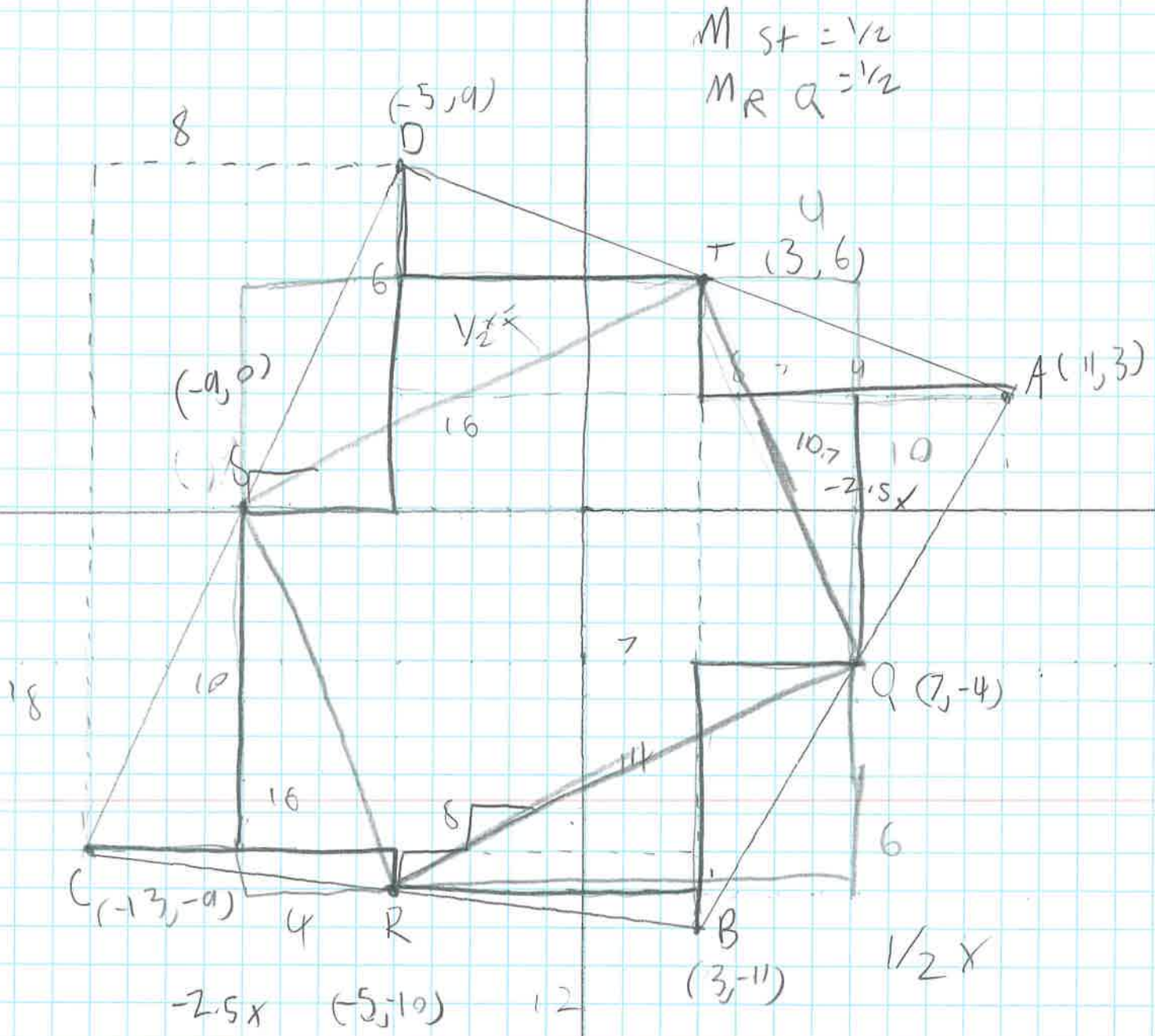
spot where the midpoint.

2 slope triangles
 The
 ratio
 is the

Part 2: Special Quadrilaterals

~~rectangle~~ / parallelogram^m, This is because
that the sides on opposite sides have
~~different~~ the same slopes. Also a slope
triangle ratio = $\frac{1}{1}$ so 2 opposite sides
are the same length. Slopes are opposite though
not a right angle

white beard tree 4542



$$m_{TR} = \frac{-5}{2}$$

$$m_{RQ} = \frac{-5}{2}$$

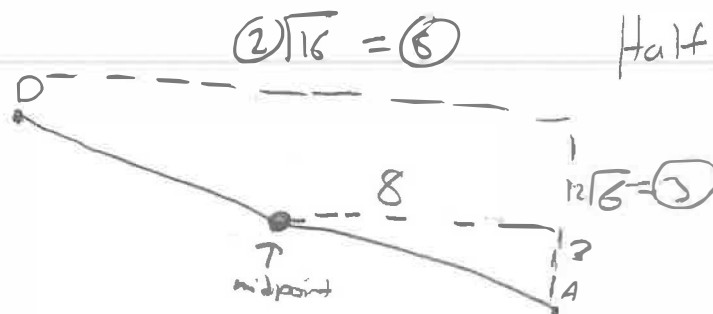
Whitebeard's Treasure

3- Read	
1st: Bury treasure on Tilki island. Archaeologists found a map and is trying to find the treasure.	Two fences for media and Archaeologist to work one for media and one for Archaeologist
2nd: 200 years ago 2 fences	
3rd: What are the areas of the two fences? What are the perimeters of the two fences? What are the dimensions of the fences?	

Justification

Part 1: Midpoint

I think the midpoints are $(3, 6)$, $(9, 0)$, $(7, -4)$, and $(-5, -10)$ because I found the slope triangles of each line and when I found the length and width of the triangles, I divided them by two, then I did the slope triangle of the half of the length and width. Then where the point was, I labeled as the midpoint.

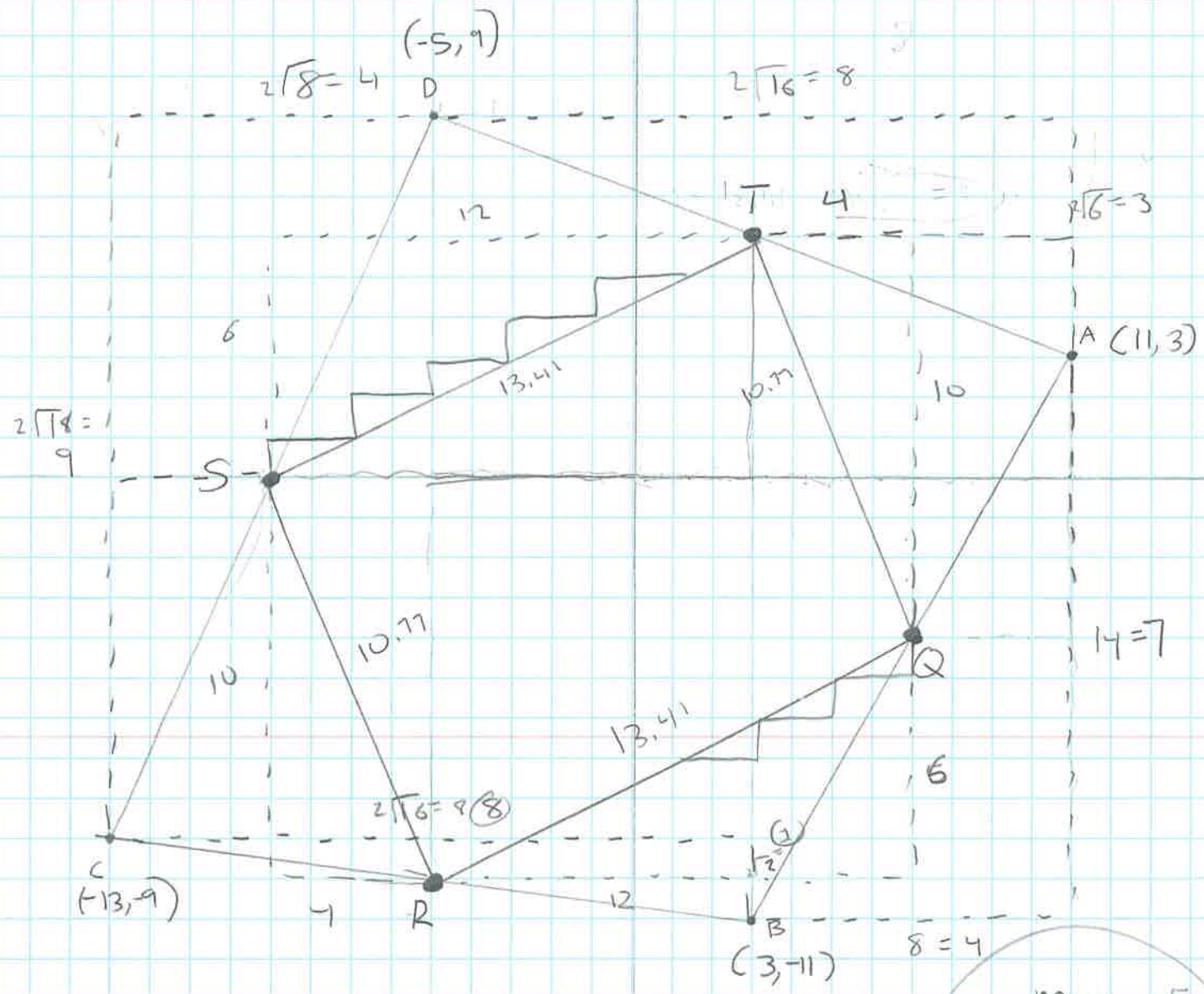


Part 2: Special Quadrilaterals

Parallelogram
It is a ~~rectangle~~ because I got the slope triangles for each line segment then used the pythagorean theorem to find the hypotenus and one pair unequal and other two sides are equal and the angles are not 90° because the slopes when multiplied don't give -1

$$m_{ST} = \frac{1}{2}$$

$$m_{RQ} = \frac{1}{2}$$



$$m_{TR} = -\frac{1}{2}$$

$$m_{SR} = -\frac{1}{2}$$

Whitebeard's Treasure

3- Read

1st: We need erect to fences in order for the archeologists and the media to work together around the dig site of whitebeard's treasure.

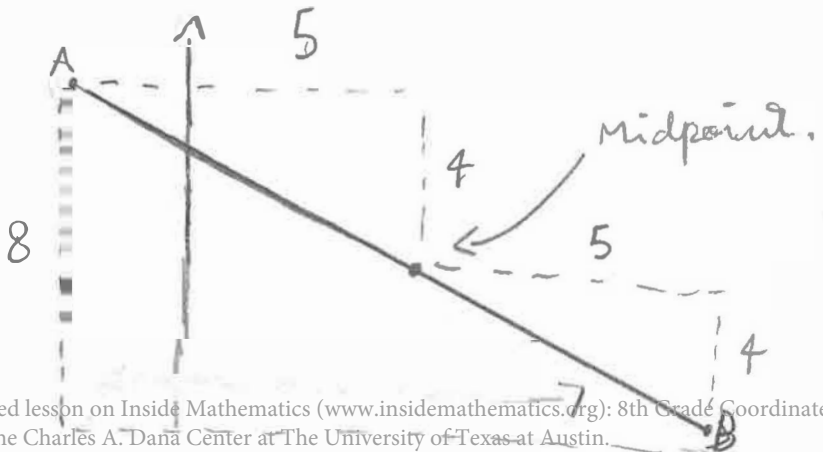
2nd: 100 years ago, two fences, one fence around the archeologists 1 fence around the dig site.

3rd: If the entire dig site is --- in circumference and the second fence must be 2 times larger than the dig site what is the perimeter of the fence?

Justification

Part 1: Midpoint

In order for one to find the midpoint, he/she could use the slope triangles or growth rates of the individual line segments to accurately find the midpoint of the line segment. This is because the slope triangles are in a way the measurement of a line and if divided by two it will give you the midpoint.



Part 2: Special Quadrilaterals

This shape is a parallelogram.

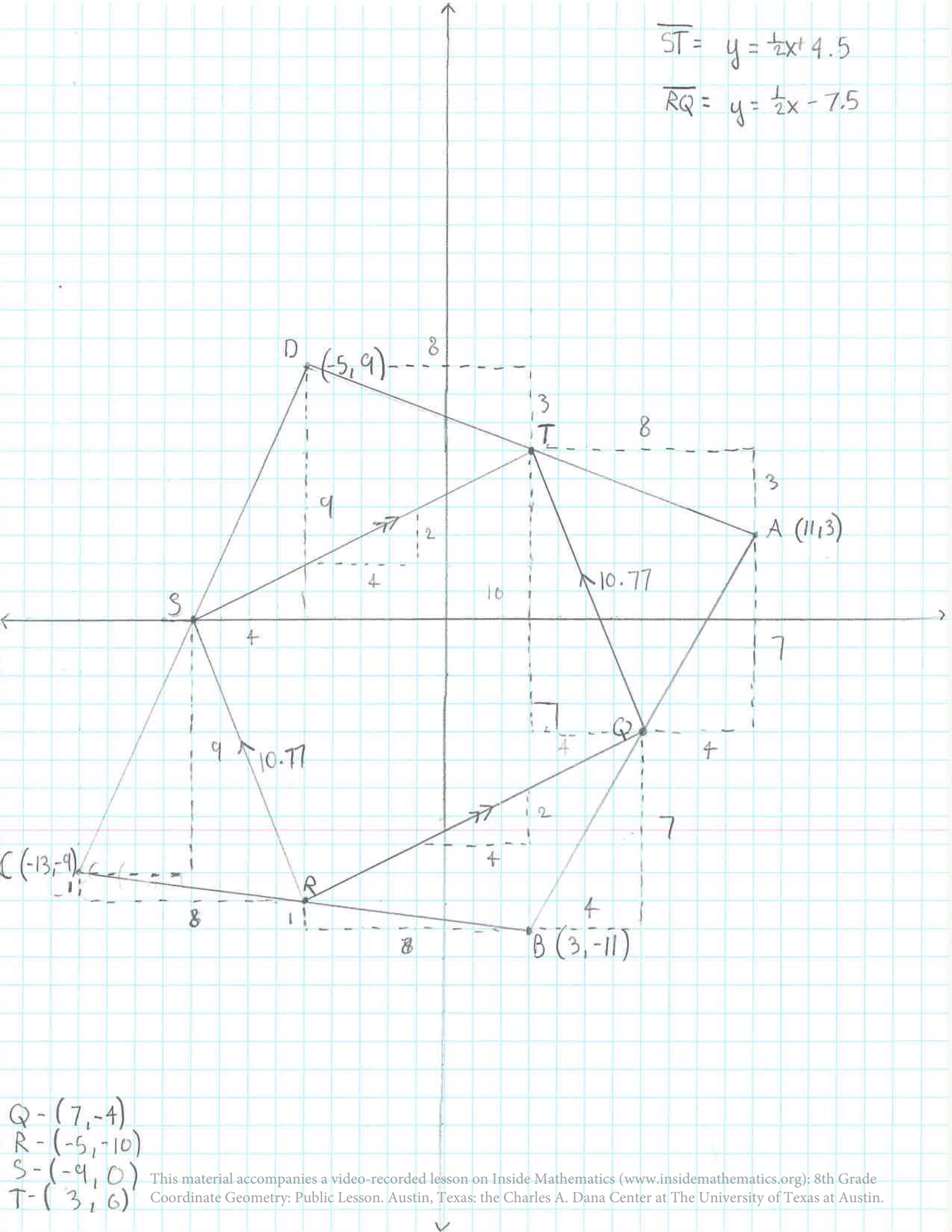
- If you find the slopes of line segment \overline{ST} ($y = \frac{1}{2}x + 4.5$) \overline{QR} ($y = \frac{1}{2}x - 7.5$), \overline{TQ} ($y = 2.5x + 13.5$), \overline{SR} ($y = 2.5x - 20$). This proves that lines \overline{ST} and \overline{QR} are parallel because they have the same slope. Also, lines \overline{TQ} and \overline{SR} have the same slope and are also parallel.

- By using pythagorean theorem you find that the shape cannot be a square because sides are not equal.

- Cannot be a rectangle because lines \overline{ST} and \overline{SR} (this is an example) slopes are not reciprocals so the lines are not perpendicular. The shape has no 90° angles.

$$\overline{ST} = y = \frac{1}{2}x + 4.5$$

$$\overline{RQ} = y = \frac{1}{2}x - 7.5$$

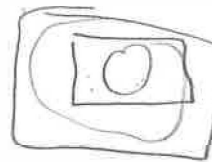


- Q - (7, -4)
- R - (-5, -10)
- S - (-9, 0)
- T - (3, 6)

Whitebeard's Treasure

3- Read
1 st : Found treasure on island, found map of where treasure is. Officials build two fences around area, one for archeologists, the other for media.
2 nd : 2 fences, 1 fence around archeologists area, another around dig site, 200 yds by 140.
3 rd : If the inner fences perimeter is 100 ft, and the width of the fences is 1.5, what is the Area of the outer fence.

Justification



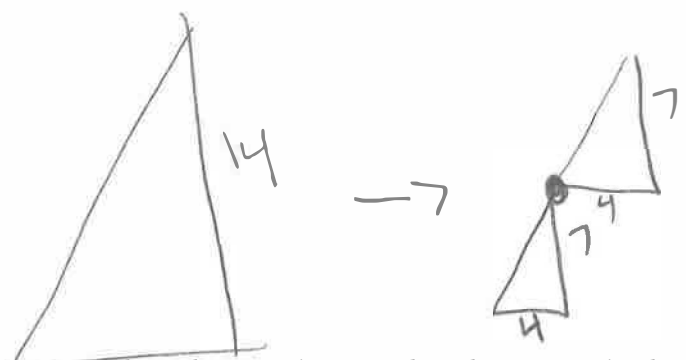
Part 1: Midpoint

Midpoints: $Q(7, -4)$ $R(5, -10)$ $S(9, 0)$ $T(3, 6)$

To find the midpoints using slope triangles. For example with line \overline{AB} , I first measured how far they were away in length. Then I found the distance between the two in width.

I got 14 away in length and 8 away in width. I then divided both those numbers in two to find the midpoint. I did this because the midpoint is exactly half the line.

I got $(7, -4)$ for point Q and repeated the process for the other lines.



Part 2: Special Quadrilaterals

The claim that the midpoints form a parallelogram. The lines are \overline{TA} , \overline{AR} , \overline{SR} , and \overline{ST} . For it to be a parallelogram, the opposite sides have to be parallel. I did this by checking the slopes. I got $-\frac{5}{2}$ for lines \overline{TA} and \overline{SR} proving that those lines are parallel. I got $\frac{1}{2}$ for both \overline{AR} and \overline{ST} proving that those lines are parallel. If a shape has two sets of parallel lines it is a parallelogram.



\overline{AB} : 1.6, 1 units

slope of TQ : $(3, 6)$

$(7, -4)$

$$\frac{10}{-4} = \frac{-5}{-2}$$

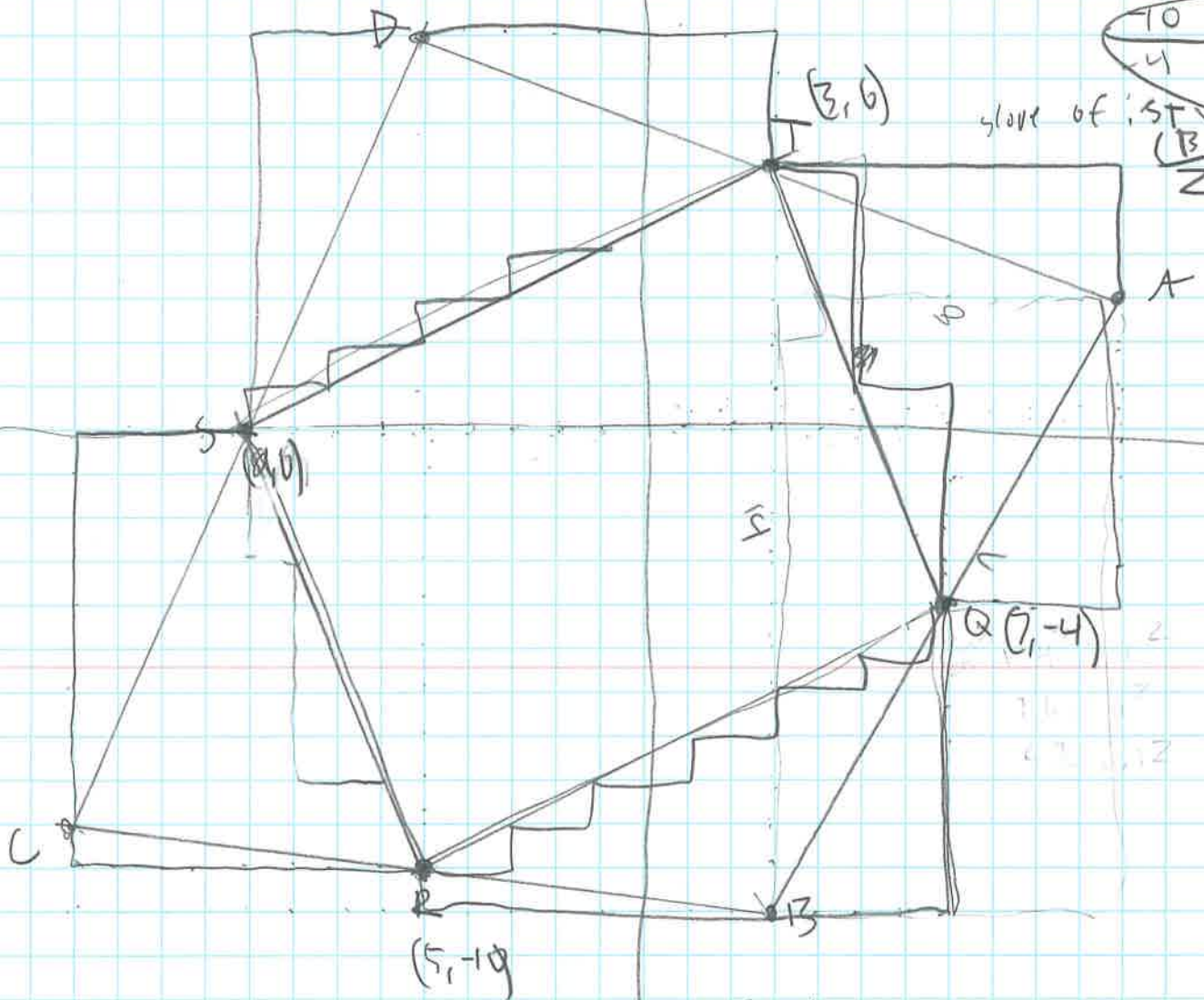
slope of QR : $(7, -4)$ $(5, -10)$

$$\frac{6}{-6} = \frac{1}{-1}$$

slope of ST : $(5, -10)$, $(9, 0)$

$$\frac{10}{-4} = \frac{-5}{-2}$$

slope of ST : $\frac{10}{-4}$



$3, -11$
 $7, -11$

Whitebeard's Treasure

3- Read	
1 st :	Whitebeard's buried treasure on Tiki Island 200 years ago. Archaeologists found a map, but people want to find the treasure for themselves. Two fences, separating people and archaeologists
2 nd :	2 fences - one for archaeologists area one w/ media access surrounding whole dig site
3 rd :	If the length of one fence is twice the length of the other, what is the ratio of the radii? If the radius of one fence is 4 meters and the other is 12 meters, how many times larger is the 12 meter radius fence.

Justification

Part 1: Midpoint

The strategy I used was to calculate the lengths of each line by using Pythagorean Theorem and each line's slope triangle. Once I had each side's length, I divided it into two to find the midpoint and used a ruler to mark it precisely.

- ① draw slope triangle
- ② calculate length of side (hypotenuse) using Pythagorean Theorem
- ③ divide by two (finding midpoint)
- ④ Use ruler to draw.

Part 2: Special Quadrilaterals

I have the cerebral capacity to comprehend that this shape is a parallelogram.

Evidence 1: when measuring the angles of QRST, the opposite angles are congruent. $\angle R$ and $\angle T$ are 85° , and $\angle Q$ and $\angle S$ are 95° . Because the opposite angles are congruent, opposite sides must have the same slope, making them parallel.

Evidence 2: when finding the slopes of the alternate sides, they are the same

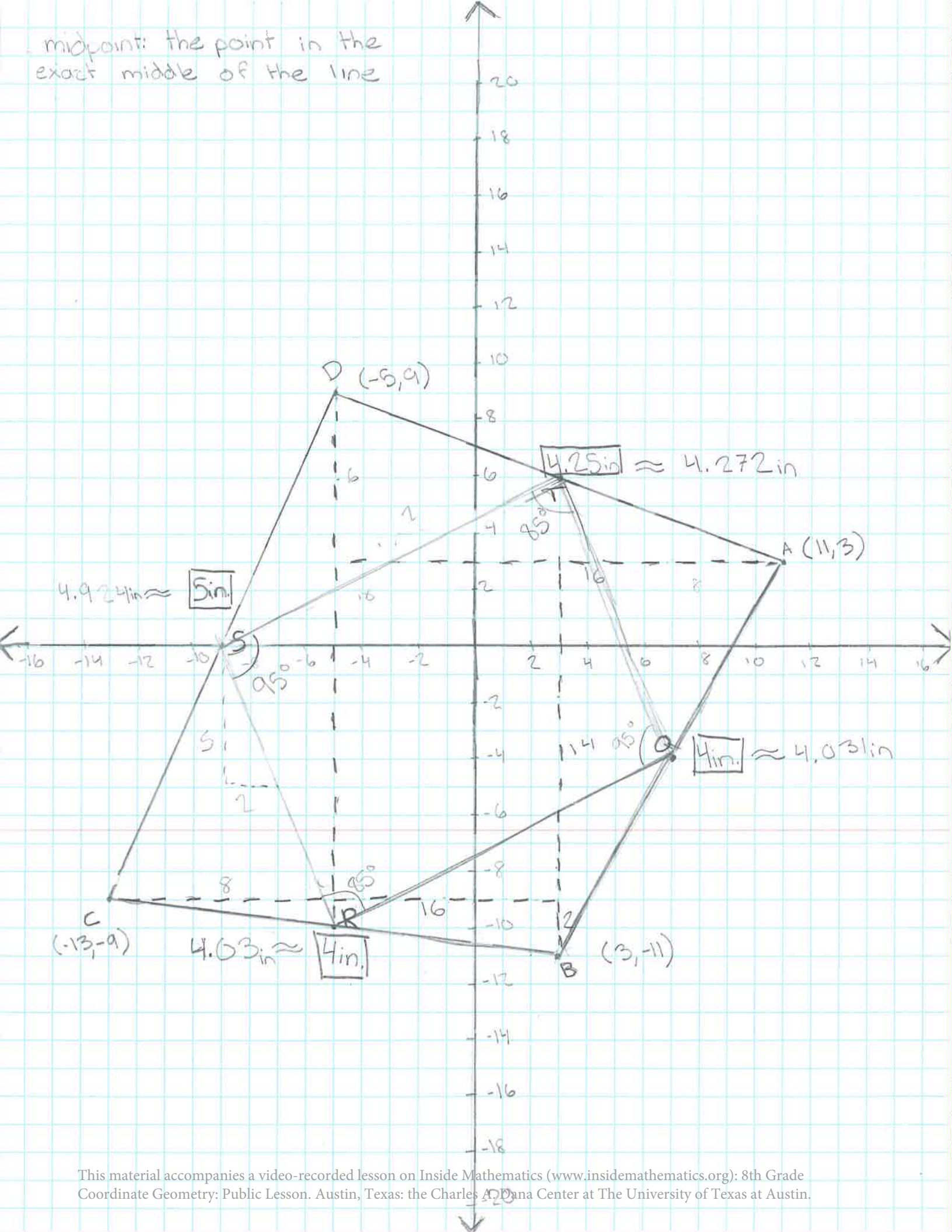
$$m_{\overline{ST}} = \frac{1}{2}$$

$$m_{\overline{RQ}} = \frac{1}{2}$$

$$m_{\overline{TA}} = -\frac{5}{2}$$

$$m_{\overline{SR}} = -\frac{5}{2}$$

midpoint: the point in the exact middle of the line



Whitebeard's Treasure

3- Read

1st: Buried treasure 200 yrs. ago. The medics & archeologists need to work together
2 fences one for medics, one for archeologists

2nd: Buried treasure over 200 yrs. ago. 2 fences

3rd: What is the ratio between the area of the 1st fence to the area of the 2nd fence. How far apart are the 2 fences

Justification

Part 1: Midpoint

I think the mid-points are $T(3,6)$, $Q(7,-4)$, $S(-9,0)$, and $R(-5,10)$

I know these are the mid points because each had a slope, and by using that slope and multiplying the slope # by 2, I will be able to get

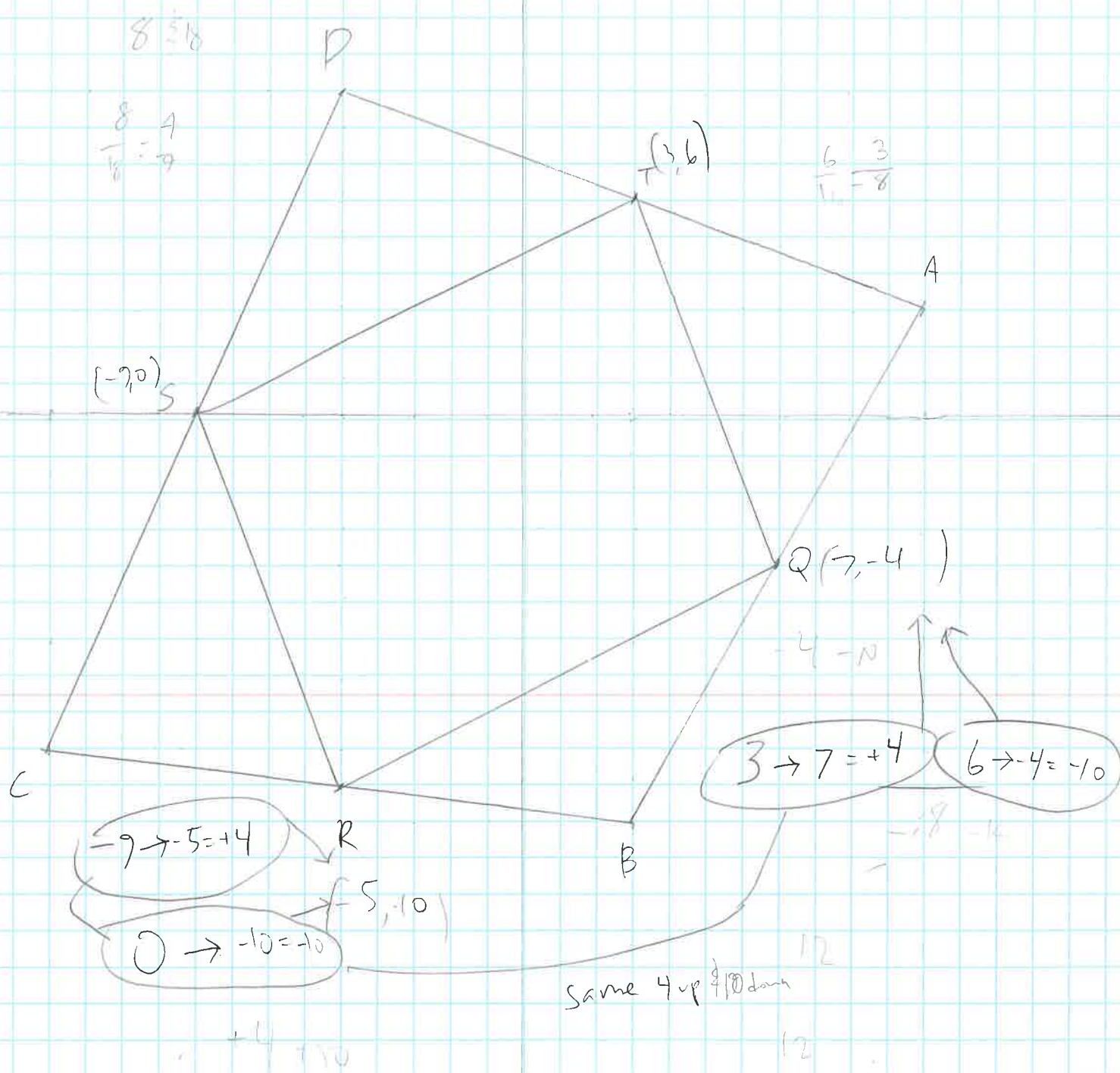
(and change to coordinates (x,y))

the mid point's coordinates for each one. For example, the slope for \overline{DA} was $-\frac{3}{8}$. I multiplied this by 2 after making it 6 down to the right 8 from point D.

Part 2: Special Quadrilaterals

4. This is a parallelogram because there are 2 pairs of parallel sides. The first one is from T to Q and S to D. Both ~~go~~ are $\frac{4}{10}$ right and 10 down slope, so they are parallel. The other, ~~is~~ R to Q we go 12 to the right, but slope

Write slope as a ratio.



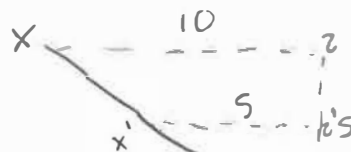
Whitebeard's Treasure

3- Read	
1 st :	- Tiki island buried treasure - Map to treasure found - two fences - media
2 nd :	- 200 years ago - 2 fences
3 rd :	- What is the area between the first fence and the second fence? - What is the ratio of the two fences

Justification

Part 1: Midpoint

My strategy was to draw the slope triangle and then divide it in half. Using this strategy, I found that the midpoints are $Q(7, -5)$, $R(5, -9)$, $S(-9, 0)$ and $T(3, 6)$. My strategy works because the slope triangles are both similar. All I am doing is dilating them by $\frac{1}{2}$. Dilation is a rigid transformation so it keeps all angles and side ratios the same. Then once it is dilated, I just match up one of the points that is adjacent to the hypotenuse of the triangle with its original point. The other point that is adjacent to the hypotenuse is the midpoint.



Part 2: Special Quadrilaterals

Quadrilateral $QRST$ is also a parallelogram. I can prove it two different ways. The first way is by proving that the slopes of the opposite lines are the same.

\overline{QR} and \overline{ST} are parallel because both of their slope triangles are $\frac{6}{12}$. That means their slopes are both $\frac{6}{12}$ or $\frac{1}{2}$. Their slopes are the same but their y -intercepts are different so they must be parallel lines. \overline{RS} and \overline{QT} are also parallel because both their slopes are $-\frac{11}{4}$ or $-2\frac{3}{4}$. Because we know the opposite sides are parallel, we can prove quadrilateral $QRST$ is a parallelogram.

Another way to prove the opposite sides are parallel (and therefore quadrilateral $QRST$ is a parallelogram) is to find the equation for each side and then solve the opposite sides as a system. The equation for \overline{QR} is $y = \frac{1}{2}x - 9$. The equation for \overline{ST} is $y = \frac{1}{2}x + 4$. So if we substitute to solve the system, we will end up with $-9 = 4$ which isn't true. So if there is no solution then the lines are parallel. We can do the same thing for lines \overline{RS} ($y = -2\frac{3}{4}x + 14\frac{1}{4}$) and \overline{QT} ($y = -2\frac{3}{4}x - 24.75$). There is no solution for either system which proves quadrilateral $QRST$ is also a parallelogram.

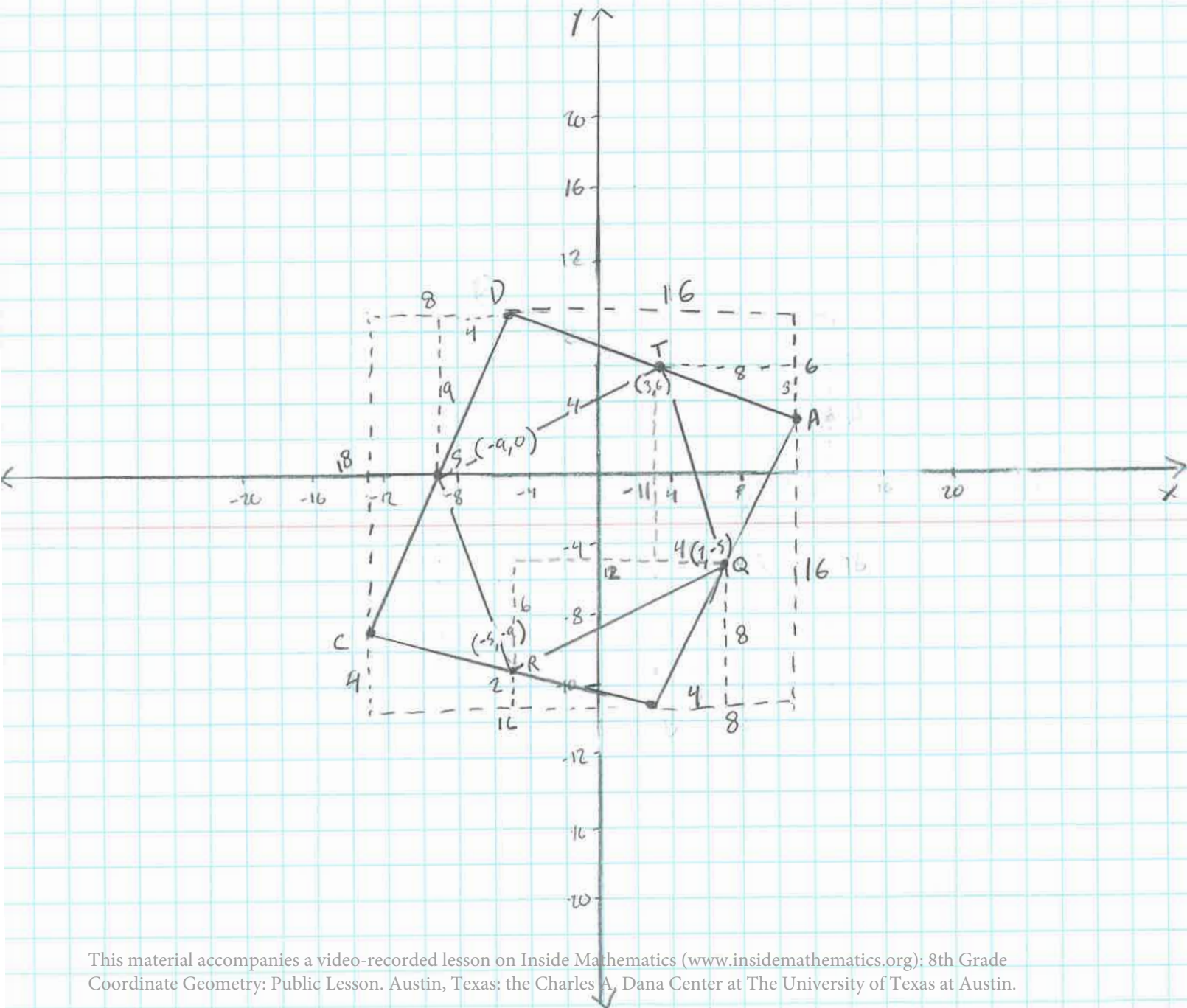
$$6 = 2\frac{3}{4}(3) + b$$

$$6 = 8\frac{1}{4} + b$$

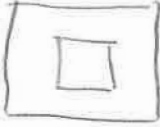
$$-2\frac{1}{4} = b$$

$$0 = 2\frac{3}{4}(-a) + b$$

$$-24.75$$



Whitebeard's Treasure

3- Read	
1 st :	Whitebeard buried treasure on Tikoi island. People set up two fences, one for where the digger spot is and one for where the site.
2 nd :	200 years ago, it was buried. Two fences, one larger than the other. 
3 rd :	What are the dimensions of the fences? How large is the dig site? What is the area between the first fence and the second fence?

Justification

Part 1: Midpoint

I think that the midpoints of the fences are:

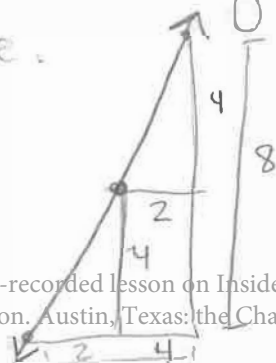
$$(\overline{AB}) \text{ Q: } (7, -4)$$

$$(\overline{BC}) \text{ R: } (-5, -11)$$

$$(\overline{CD}) \text{ S: } (-4, 0)$$

$$(\overline{DA}) \text{ T: } (3, 6)$$

I found these midpoints by finding the slope triangle of two points, and divided the height and width by two to end up with two congruent slope triangles. The spot where the two slope triangles hit is the midpoint of the line.

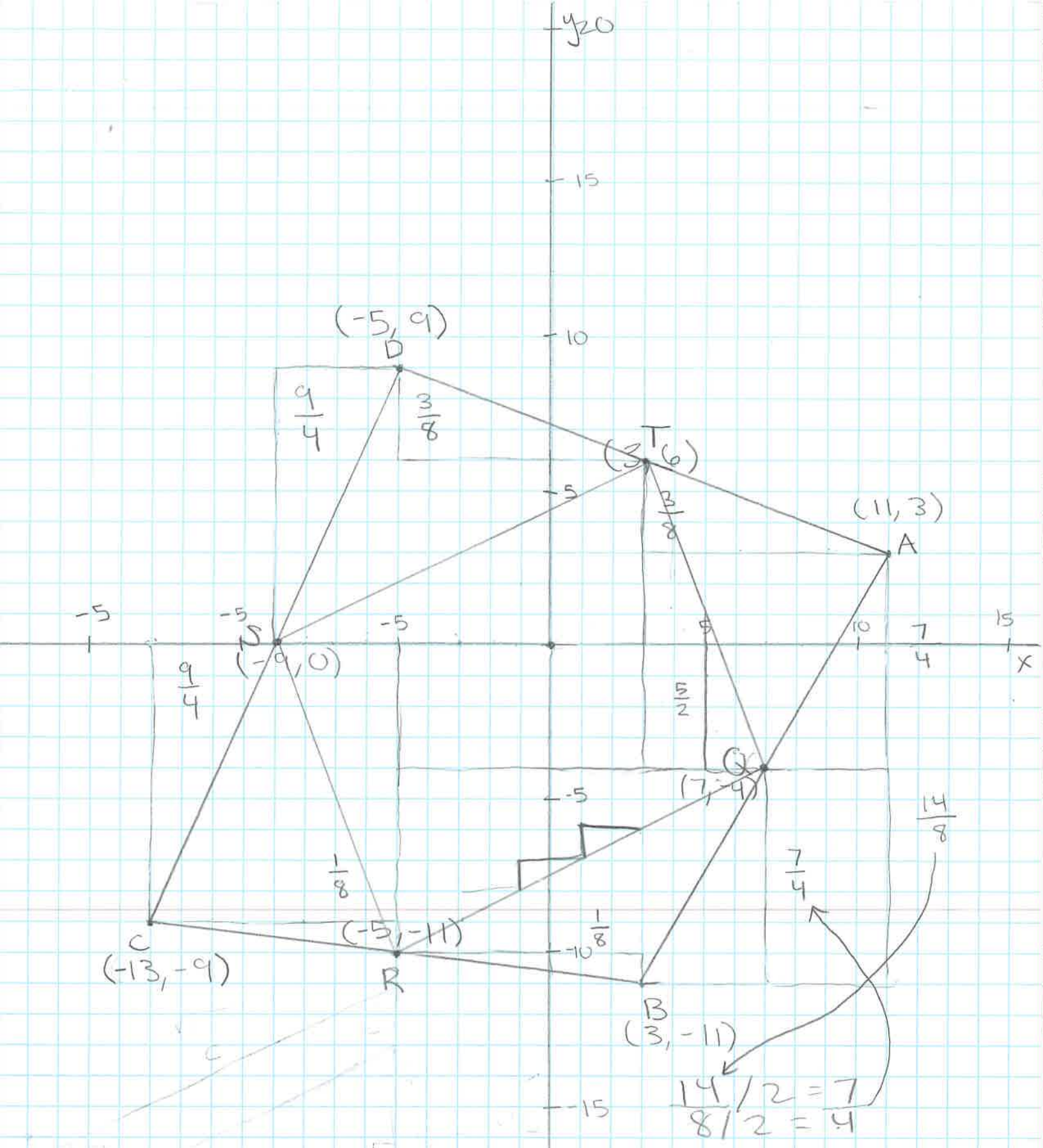


Part 2: Special Quadrilaterals

The inner quadrilateral is a parallelogram and not a rectangle because for the angles to be 90° , the two lines that intersect to create the angle has to be perpendicular. For the inner quadrilateral, the bottom line (\overline{RQ}) the slope is $\frac{1}{2}$ which means the line intersecting it (\overline{TQ} or \overline{SR}) should be -2 or $-\frac{2}{1}$ when it is actually $-\frac{5}{2}$. This is why people might think that this quadrilateral is a square because at first glance, the angles look like right angles, and the slope $-\frac{5}{2}$ is really close to $-\frac{4}{2}$ which is -2 .

Why is it a parallelogram?

3



$$\frac{14}{8} \div 2 = \frac{7}{4}$$

$$\frac{8}{2} = 4$$