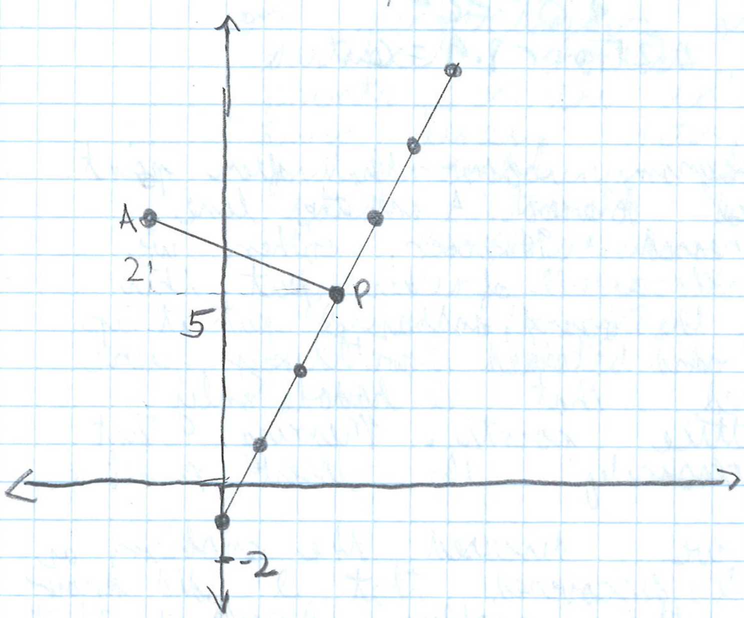
# Journal #5

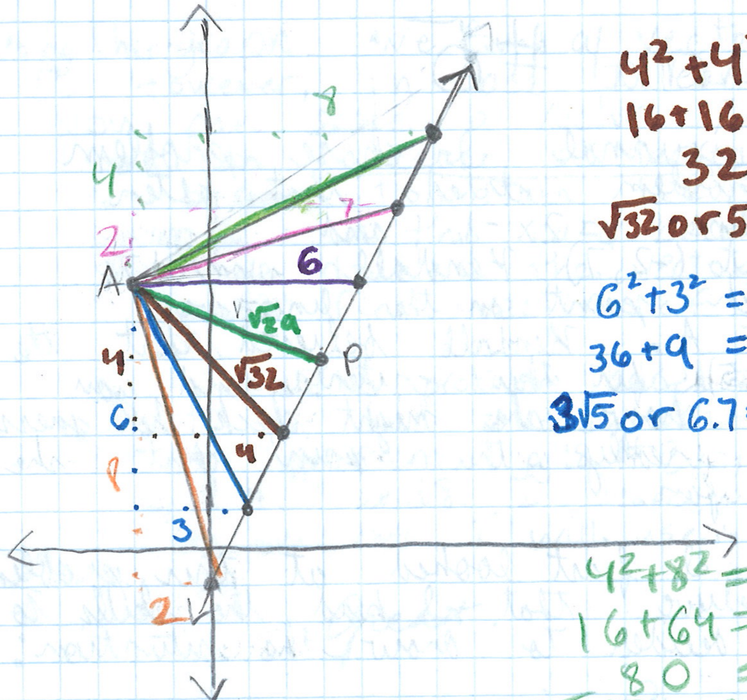
For this journal I chose problem
8 pg. 15. This problem stated that after drawing the line $y = 2x - 1$ and the point A at $(-2, 7)$ Kendall wanted to find out which point on the line was closest to point A. Kendall believed that the point P at $(3,5)$ fit this criteria and you were asked how she might check her guess and if P was really the point that she was looking for.

When I first looked at this problem I did not believe that I had the skills to do it. So, I decided to draw the situation:




$2^2 + 5^2 = c^2$
$4 + 25 = c^2$
$\sqrt{29} = c$

After studying my diagram I used the pythagorean theorem to find the distance between A and P. I got $\sqrt{29}$ which is about 5.3. After doing this I created another diagram that connected A with other points on the line. I used this to find the distance between A and other points on the line using the pythagorean theorem (shown on next page).




$4^2+4^2=c^2$
$16+16=c^2$
$32=c^2$
$\sqrt{32}$ or $5.6=c$

$8^2+2^2=c^2$
$64+4=c^2$
$68=c^2$
$2\sqrt{17}$ or $8.2=c$

$6^2+3^2=c^2$
$36+9=c^2$
$3\sqrt{5}$ or $6.7=c$

$2^2+7^2=c^2$
$4+49=c^2$
$53=c^2$
$\sqrt{53}$ or $7.2=c$

$4^2+8^2=c^2$
$16+64=c^2$
$80=c^2$
$2\sqrt{2}\sqrt{10}$ or $8.9=c$

From this diagram I saw that after point P the distance between A and the line $y=2x-1$ increased. However, when we did this in class all of us put this problem on the board, and as I put it up I listened to and talked with my peers and discovered that I had only considered lattice points. Meaning that P wasn't necessarily the closest point.

great description

As we discused the problem as a group I discovered that I did know how to do this problem. I realized that I had to find a line perpendicular to $y=2x-1$ that goes through the point A. In order to do this you need to find the negative reciprocal of the slope which in this case is $-1/2$. You must then plugg this slope along with the coordinates of point A into point-slope form ( $y=m(x-x_1)+y_1$) to get the equation $y=-1/2(x-2)+7$. ✓ Then you need to find the intersection point of these two lines. You can do this two ways, by solving it using algebra or by using the calculator. I chose to use my