What if I use ordered pairs??
Partitioning a segment : $\left(\dfrac{a}{a+b}\left(x_2-x_1\right)+x_1 \;,\; \dfrac{a}{a+b}\left(y_2-y_1\right)+y_1 \right)$

$\underset{x_1\,y_1}{}$

6. Find the coordinate of T that partitions A(1,2) to B(5,3) into a 1:2 ratio.

$\dfrac{1}{3}(5-1)+1 \;,\quad \dfrac{1}{3}(3-2)+2$

$\dfrac{1}{3}(4)+1$

$\boxed{(2.3, 2.3)}$

2.3 $\qquad\qquad$ 2.3

7. Find the coordinates of T that partition A(-5,1) to B(3,0) into a 2:3 ratio.

$\underset{x_1\,y_1}{}$

$\dfrac{2}{5}(3+5)+-5 \;,\quad \dfrac{2}{5}(0-1)+1$

$\boxed{(-1.8, 0.6)}$

8. Find the coordinates of T that partition A(3,-1) to B(-1,-2) into a 3:1 ratio.

$\dfrac{3}{4}(-1-3)+3 \qquad \dfrac{3}{4}(-2+1)-1$

$\boxed{(0, -1.75)}$

9. Find the coordinates of T that partition A(-9,5) to B(3,-1) into a 4:5 ratio.

$\dfrac{4}{9}(3+9)-9 \;,\quad \dfrac{4}{9}(-1-5)+5$

$\boxed{(-3.6, 2.3)}$

10. Find the coordinates of T that partition A(9, -10) to B (1,0) into a 5:2 ratio.

$\dfrac{5}{7}(1-9)+9 \;,\quad \dfrac{5}{7}(0+10)-10$

$\boxed{(3.3, -2.9)}$