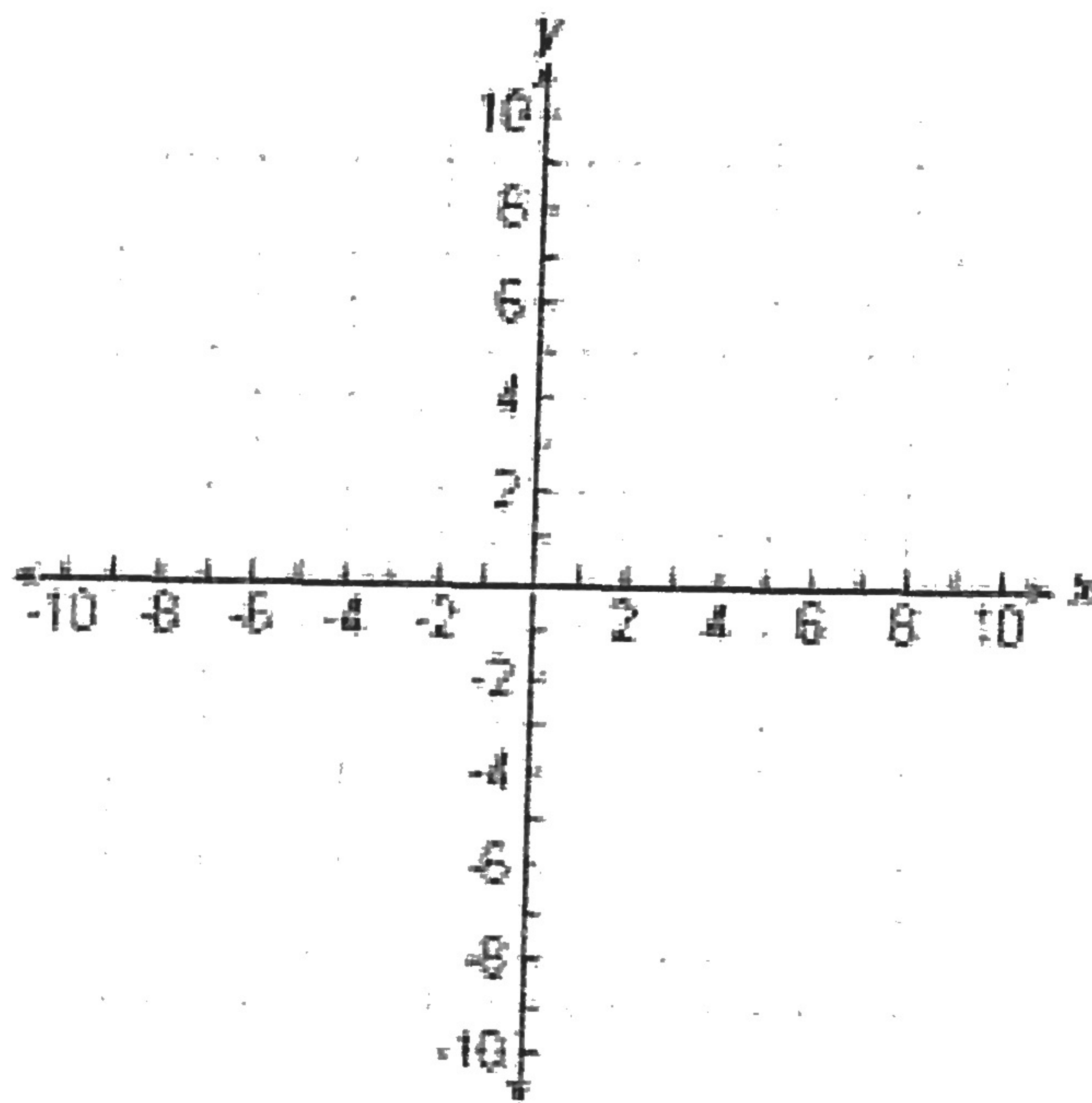


Names \_\_\_\_\_

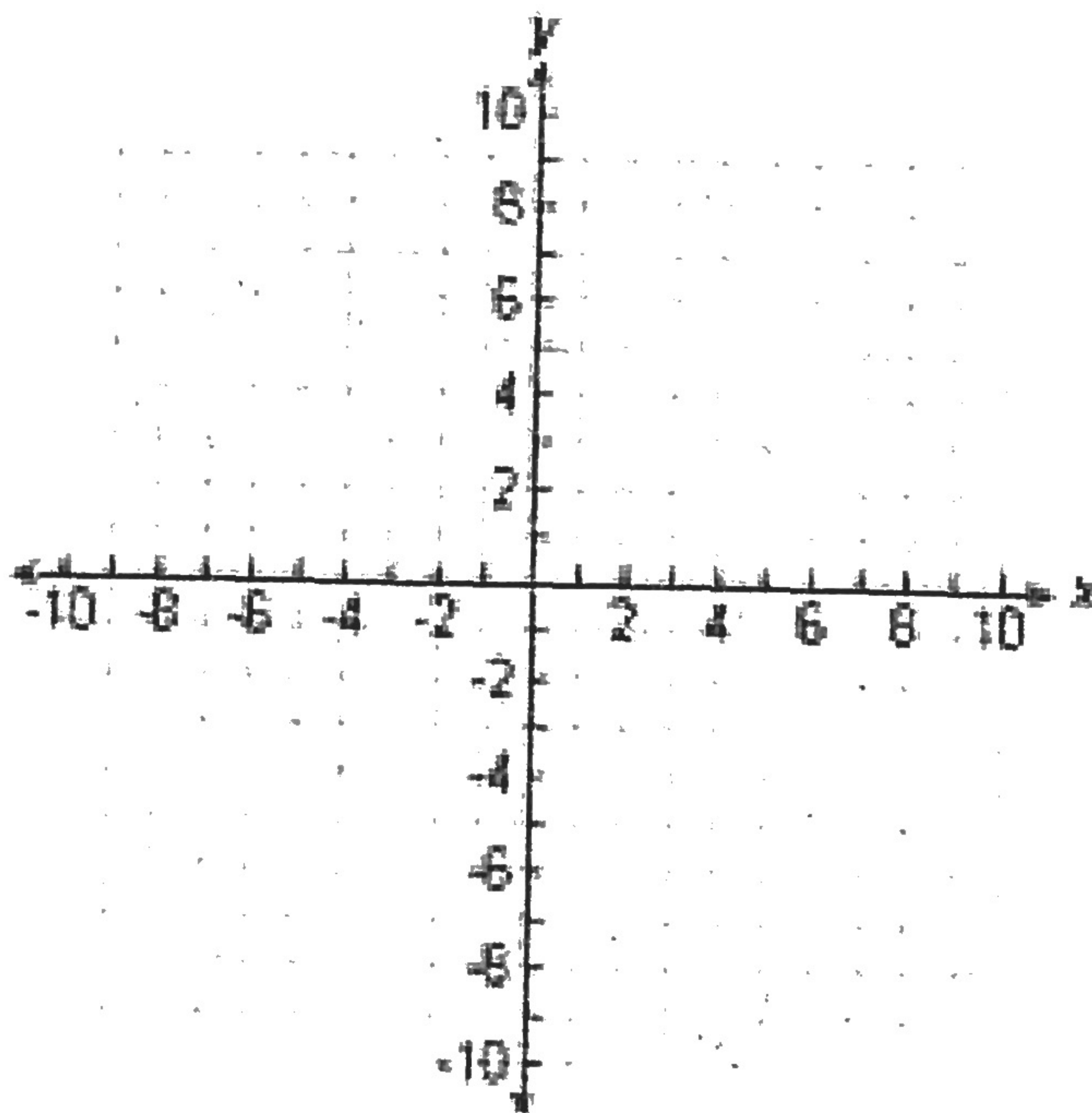
Period \_\_\_\_\_

Points of Concurrency – Algebra Review

- 1) Find the coordinates of the circumcenter of  $\triangle ABC$  with vertices  $A(0, 5)$ ,  $B(4, 5)$ , and  $C(4, -1)$ .



- 2) Find the coordinates of the centroid of the triangle with the given vertices  $S(5, 5)$ ,  $T(11, -3)$ , and  $U(-1, 1)$ .

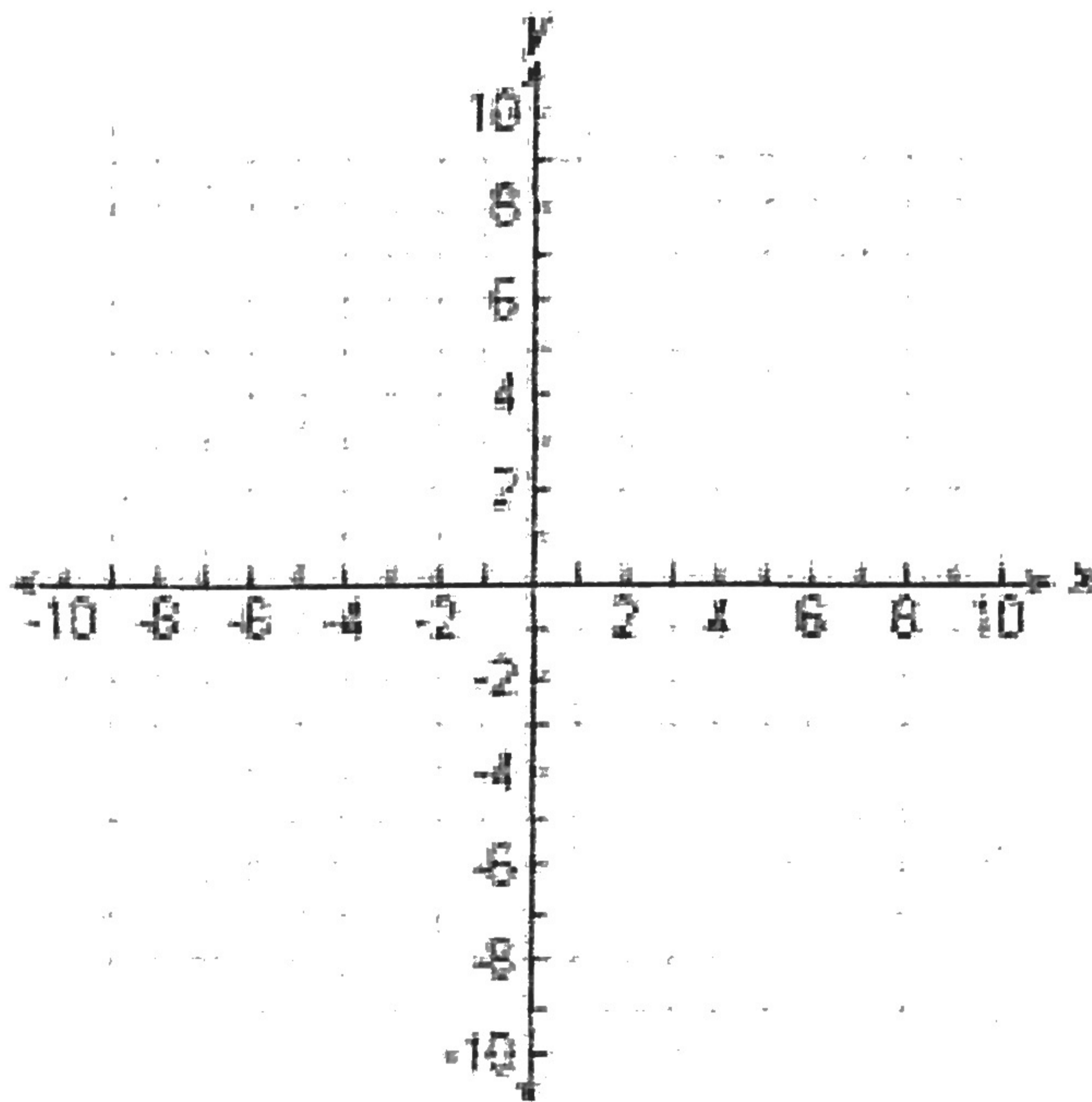


- 3) Graph the lines on the same coordinate plane. Find the centroid of the triangle formed by their intersections.

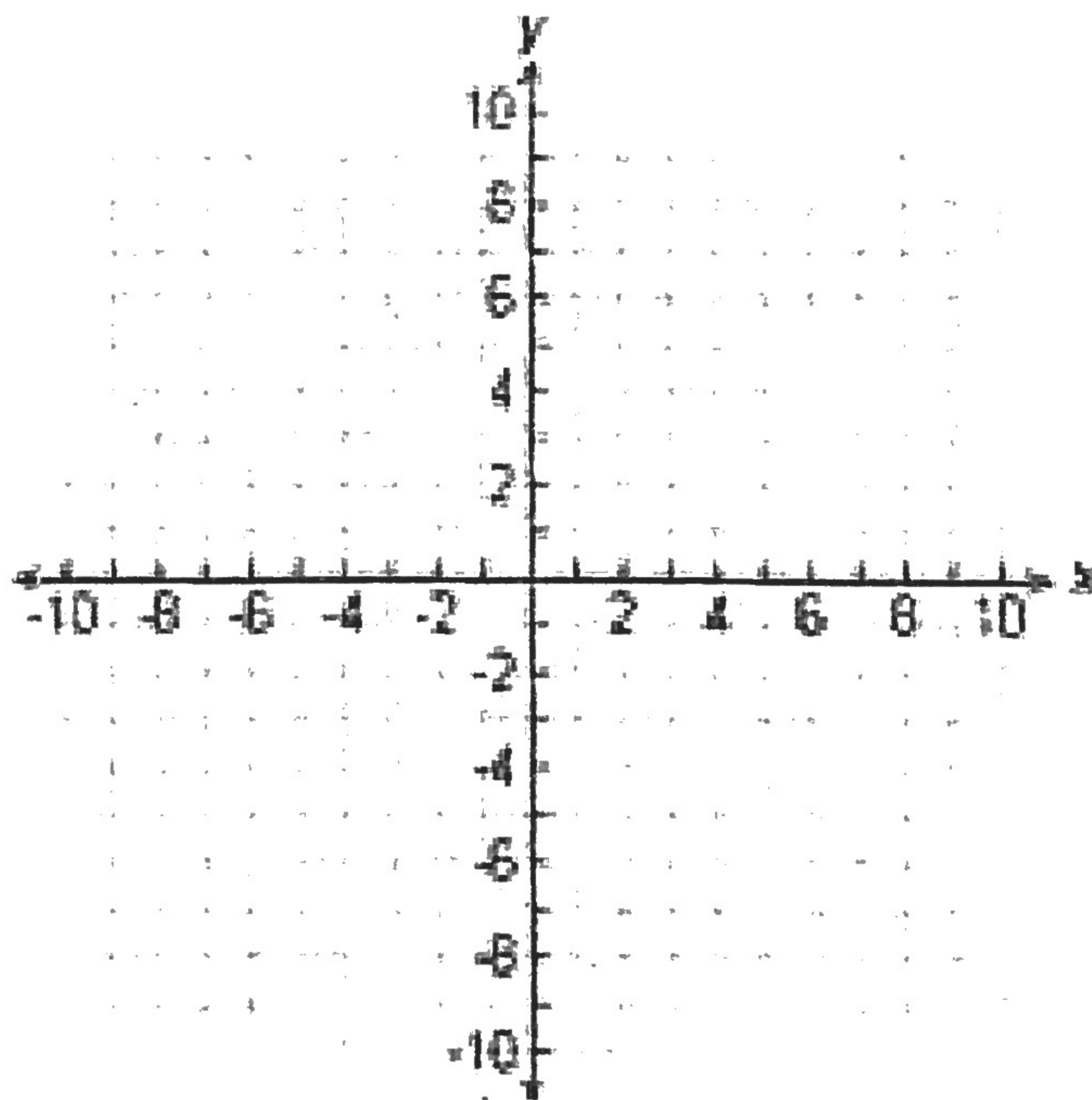
$$y_1 = 3x - 4$$

$$y_2 = \frac{3}{4}x + 5$$

$$y_3 = -\frac{3}{2}x - 4$$



- 4) Find the coordinates of the orthocenter of  $\triangle DEF$  with vertices  $D(-1, -3)$ ,  $E(-1, 5)$ , and  $F(5, -1)$ .



Names \_\_\_\_\_

Answer Key

Period \_\_\_\_\_

Points of Concurrency – Algebra Review

- 1) Find the coordinates of the circumcenter of  $\triangle ABC$  with vertices  $A(0, 5)$ ,  $B(4, 5)$ , and  $C(4, -1)$ .

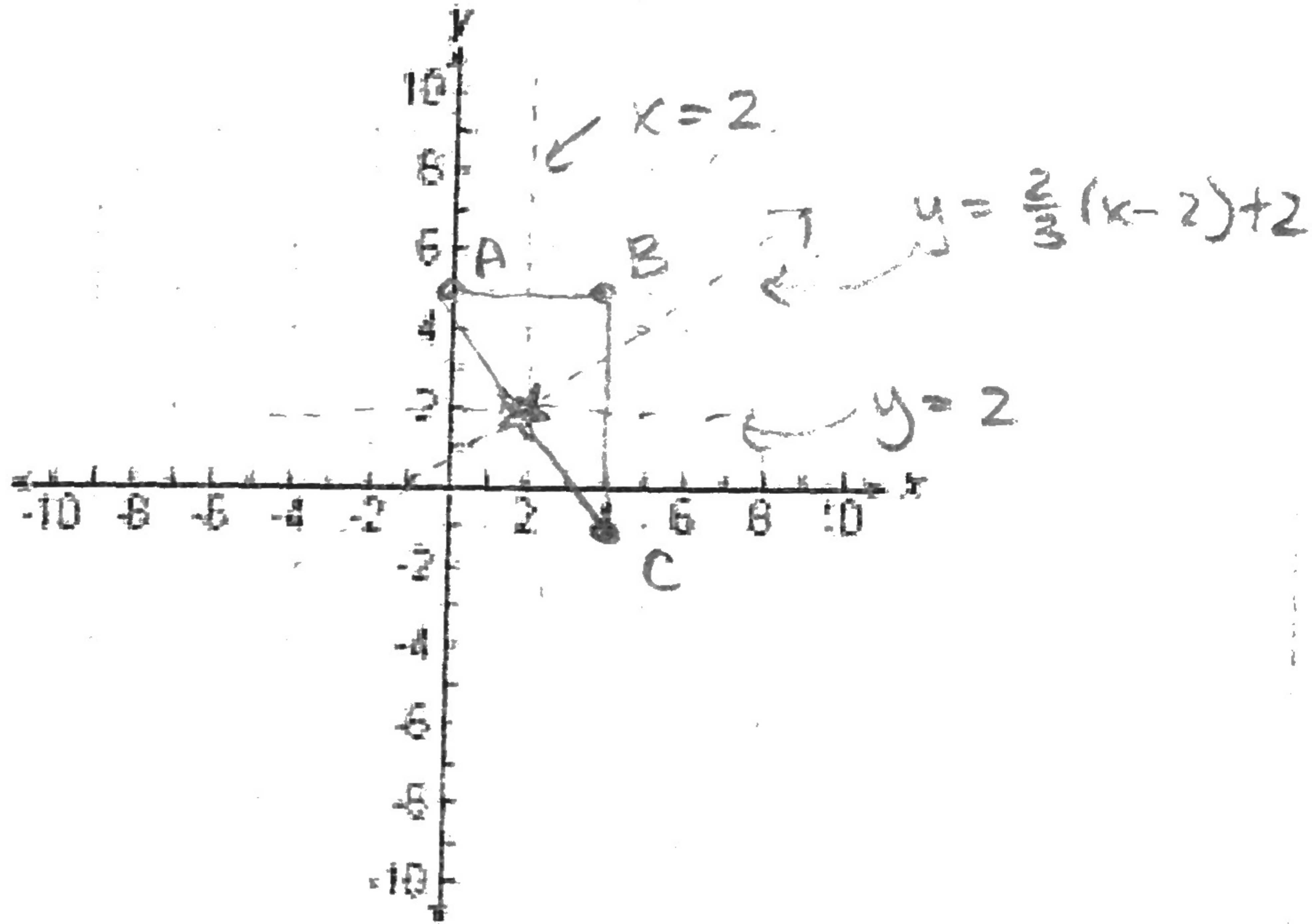
	MP	slope	eq.
AB	(2, 5)	0	$x=2$
BC	(4, 2)	und	$y=2$
CA	(2, 2)	$-6/4$	$y/6 = 2/3$

Perp bisect  $\rightarrow$  midpoint,  $\perp$

Don't need it  
but it's  
 $y = \frac{2}{3}(x-2) + 2$

Circumcenter

(2, 2)

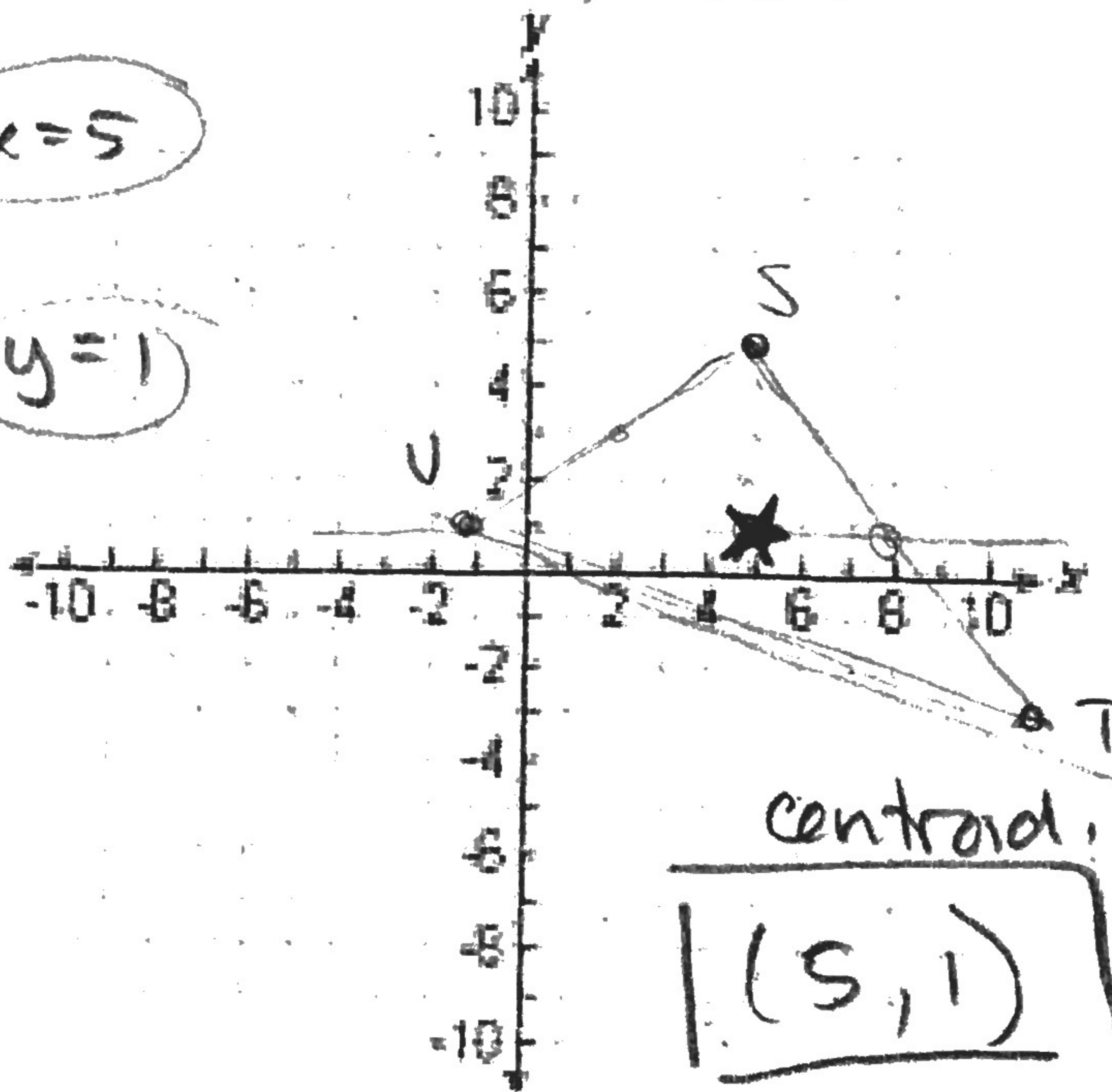


- 2) Find the coordinates of the centroid of the triangle with the given vertices  $S(5, 5)$ ,  $T(11, -3)$ , and  $U(-1, 1)$ .

Medians  $\rightarrow$  vertex, midpoint

MP of UT  $\rightarrow S'(5, -1)$   $S(5, 5)$   $x=5$   
 SU  $\rightarrow T'(2, 3)$   $T(11, -3)$   
 ST  $\rightarrow U''(8, 1)$   $U(-1, 1)$   $y=1$   
 $-\frac{6}{9} = -\frac{2}{3}$

$y = -\frac{2}{3}(x-2) + 3$  or  
 $y = -\frac{2}{3}(x-11) - 3$   
 but you don't need it!



- 3) Graph the lines on the same coordinate plane. Find the centroid of the triangle formed by their intersections.

Centroid short cut

$$\left( \frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$$

$$y_1 = 3x - 4$$

$$y_2 = \frac{3}{4}x + 5$$

$$y_3 = -\frac{3}{2}x - 4$$

$y_1, y_3$   $-3x - 4 = -\frac{3}{2}x - 4$

$$3x = -\frac{3}{2}x \quad x = 0, y = -4$$

$$V_1(0, -4)$$

$y_2, y_3$

$$\frac{3}{4}x + 5 = -\frac{3}{2}x - 4$$

$$3x + 20 = -6x - 16 \quad x = 4, y = 8$$

$$9x = -36$$

$$V_2(-4, 2)$$

$y_1, y_2$

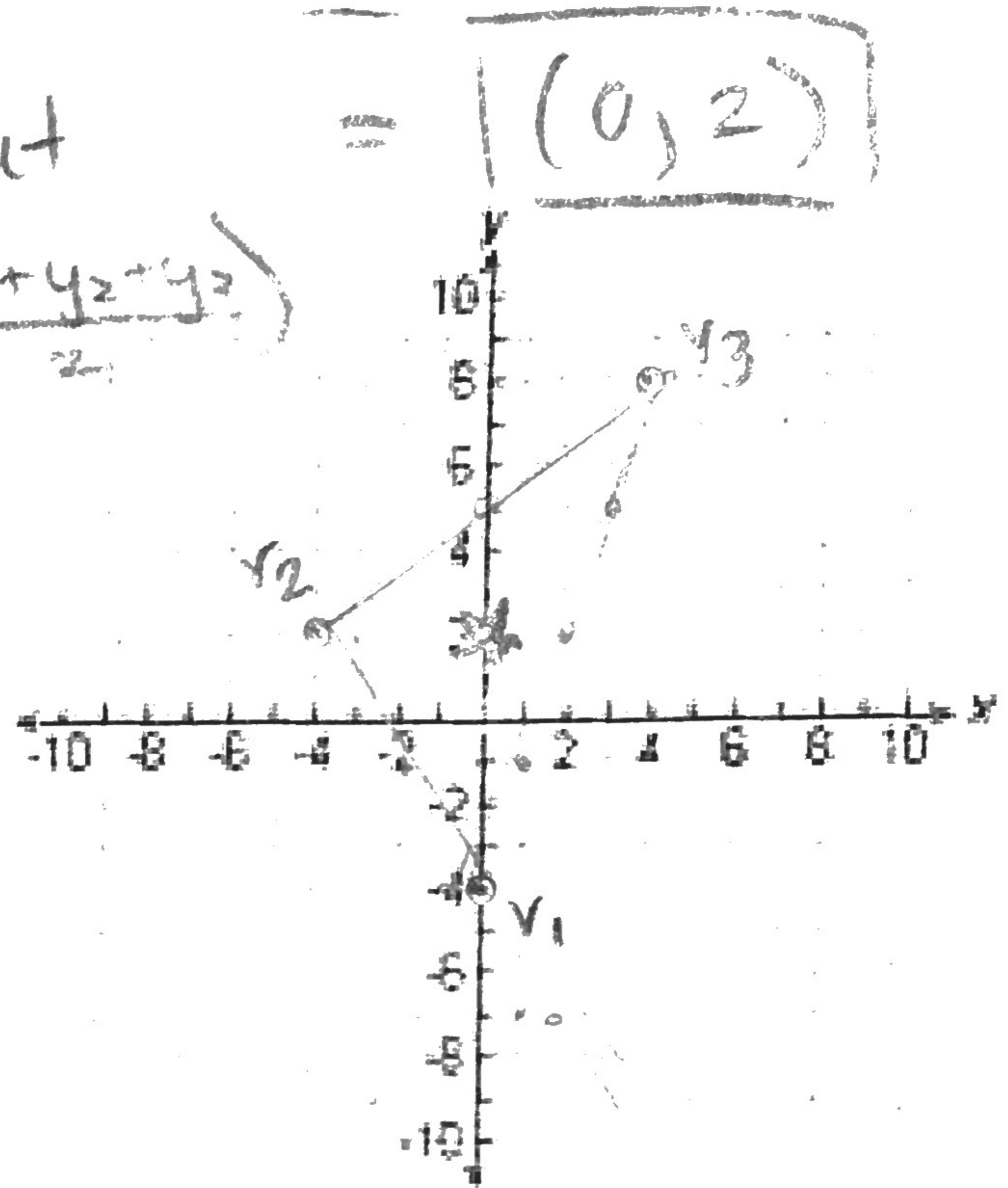
$$3x - 4 = \frac{3}{4}x + 5$$

$$12x - 16 = 3x + 20$$

$$9x = 36$$

$$x = 4, y = 8$$

$$V_3(4, 8)$$



- 4) Find the coordinates of the orthocenter of  $\triangle DEF$  with vertices  $D(-1, -3)$ ,  $E(-1, 5)$ , and  $F(5, -1)$ .

Altitudes: vertex,  $\perp$

$F(5, -1)$  horizontal  $y = -1$

$D(-1, -3)$   $EF = -6/6 = -1$   $\perp = 1$   $y = 1(x+1) - 3$

$E(-1, 5)$   $DF = 3/6 = 1/2$   $\perp = -3$   $y = -3(x+1) - 5$

Orthocenter:

$$-1 = (x+1) - 3$$

$$x = 1, y = -1$$

$$(1, -1)$$

