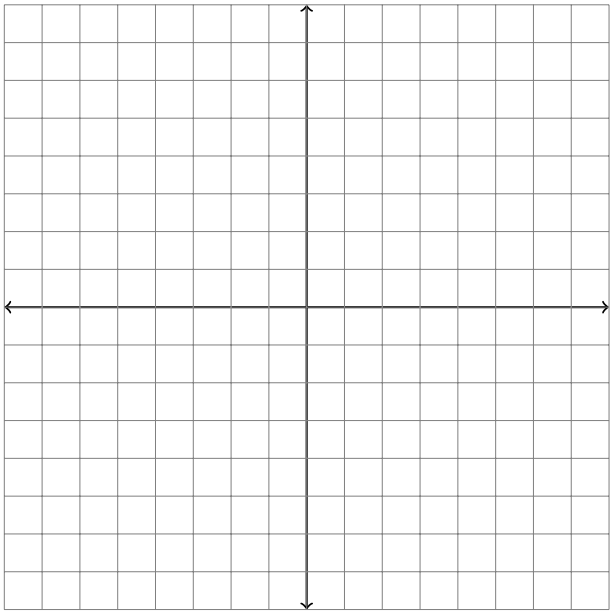
MATH 6: HANDOUT 18: COORDINATES II

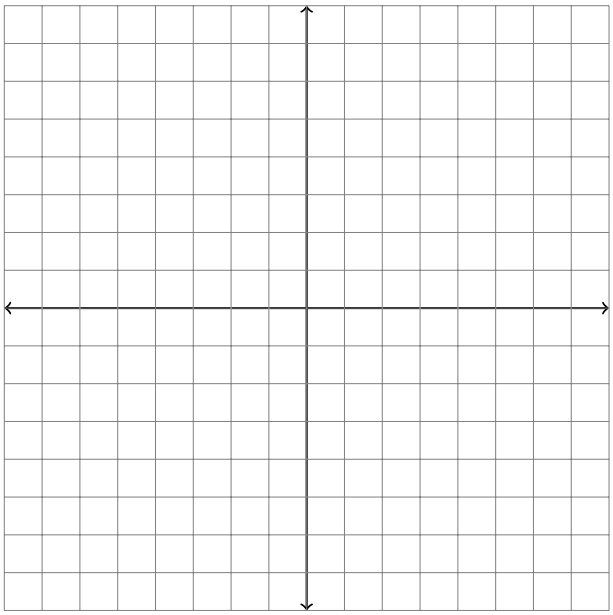
1. Find the equation of the line through $(1, 1)$ with slope 2.

2. Find the equation of the line through points $(1, 1)$ and $(3, 7)$. [Hint: what is the slope?]

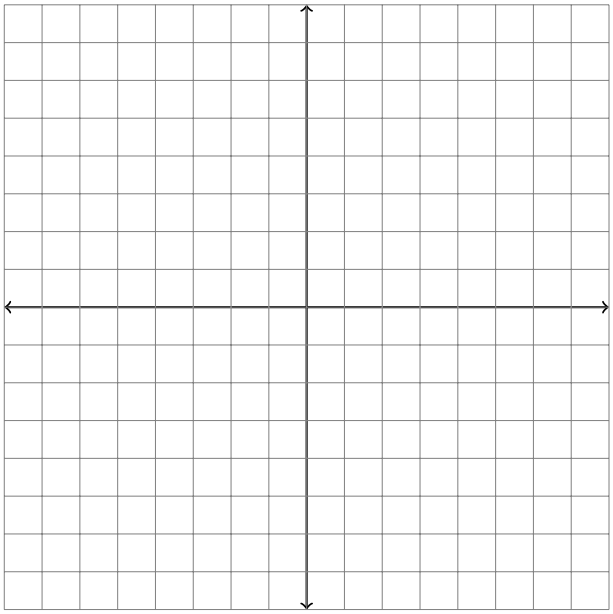
3. (a) Find k if $(1, 9)$ is on the graph of $y - 2x = k$. Sketch the graph.



(b) Find k if $(1, k)$ is on the graph of $5x + 4y - 1 = 0$. Sketch the graph.



4. Let l_1 be the graph of $y = x + 1$, l_2 be the graph of $y = x - 1$, m_1 be the graph of $y = -x + 1$, and m_2 be the graph of $y = -x - 1$.



(a) Find the intersection point of l_1 and m_1; Label this point P and write down its coordinates.

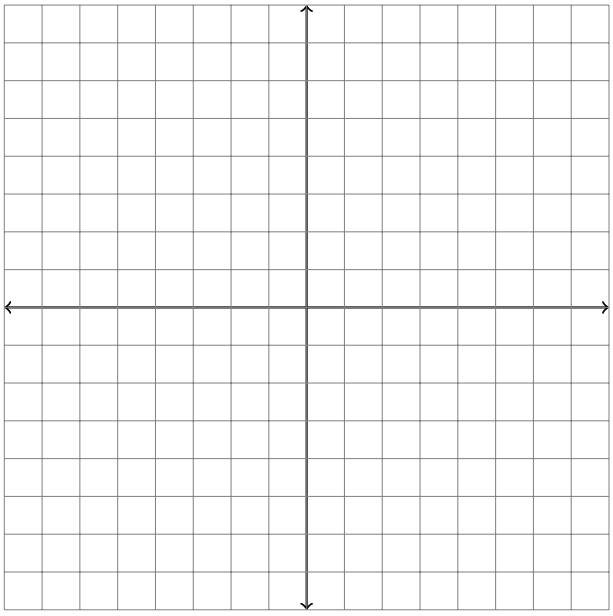
(b) Find the intersection point of l_2 and m_2; Label this point P and write down its coordinates.

(c) Find the midpoint of AB and write down its coordinates.

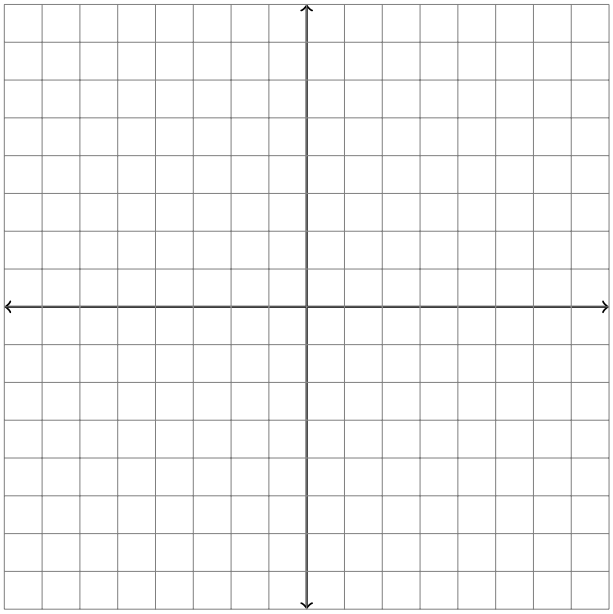
(d) Let C be the intersection point of l_1 with m_2, and D be the intersection point of l_2 with m_1. What kind of quadrilateral is $ABCD$?

(e) Explain why l_1 and l_2 are parallel. What is the distance between them?

5. Find the intersection point of a line $y = x - 3$ and a line $y = -2x + 6$. Sketch the graphs of these lines.



6. (a) Sketch the graphs of functions $y = |x + 1|$ and $y = -x + 0.25$.

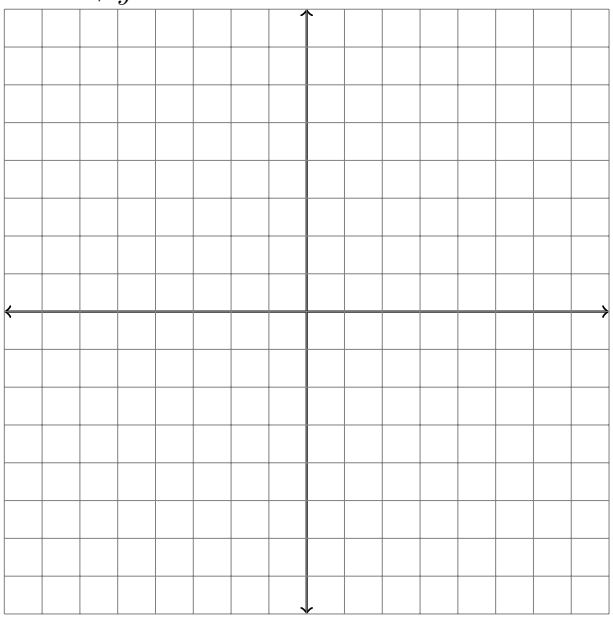


(b) How many solutions do you think this equation has?

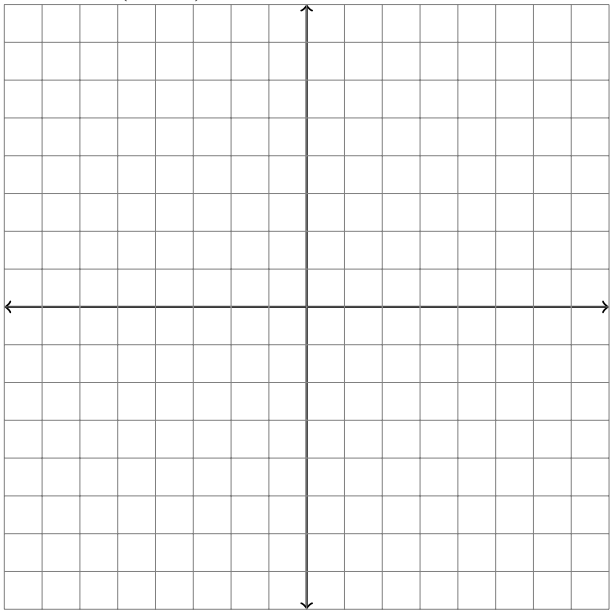
$$|x + 1| = -x + 0.25$$

Note: you are not asked to find the solutions — just answer how many are there.

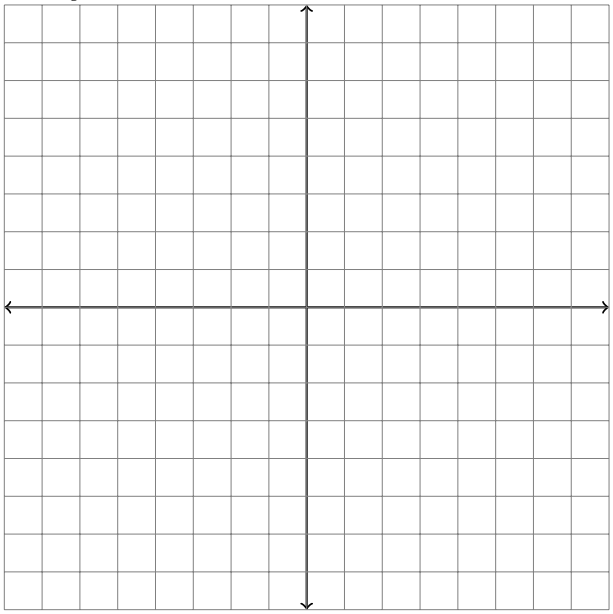
7. (a) Draw the graph of the equation $x^2 + y^2 - 1 = 0$.



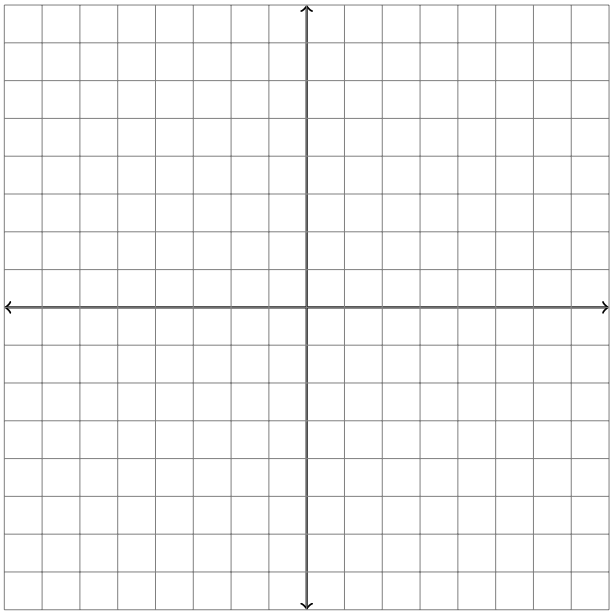
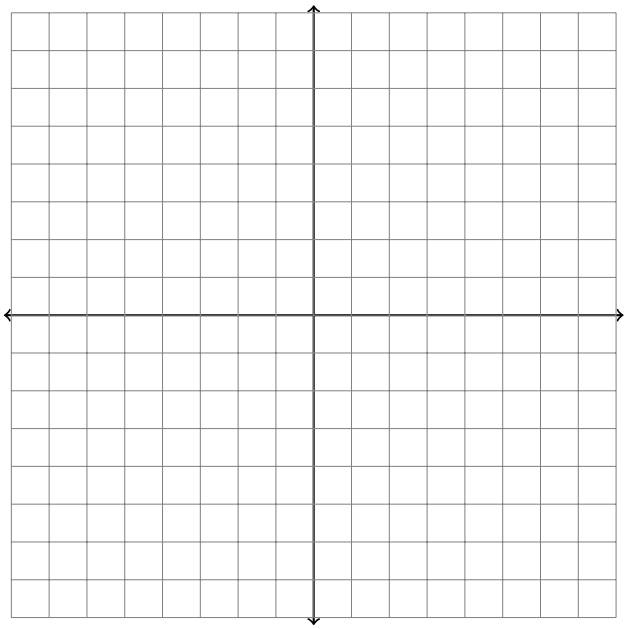
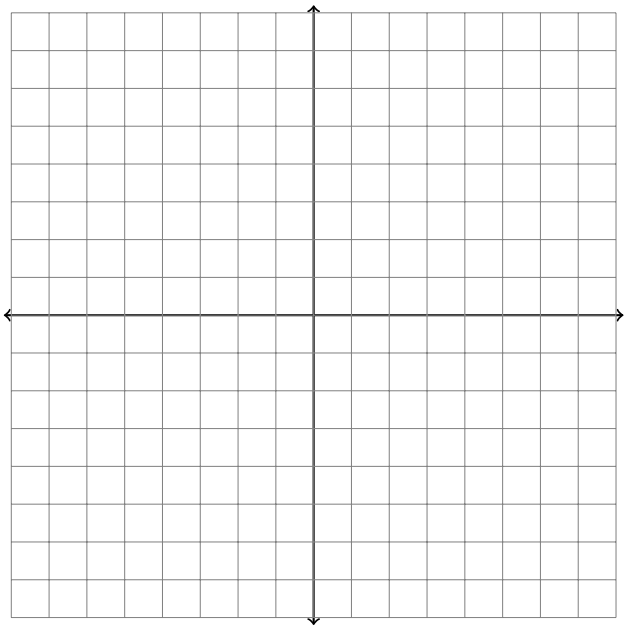
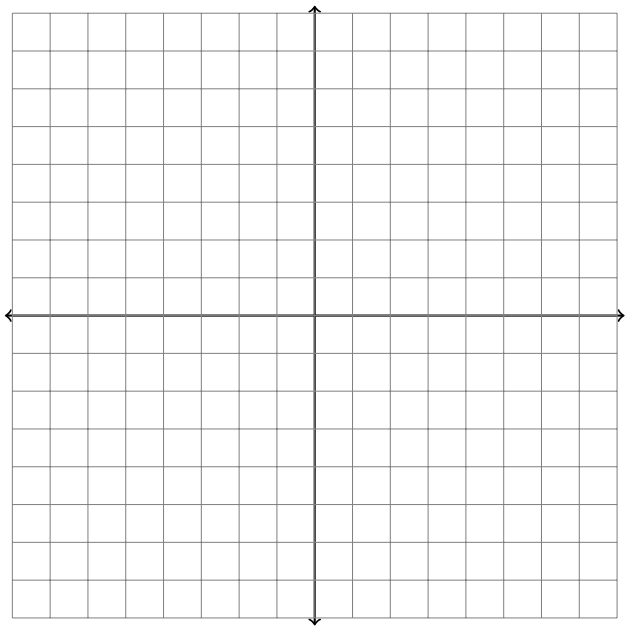
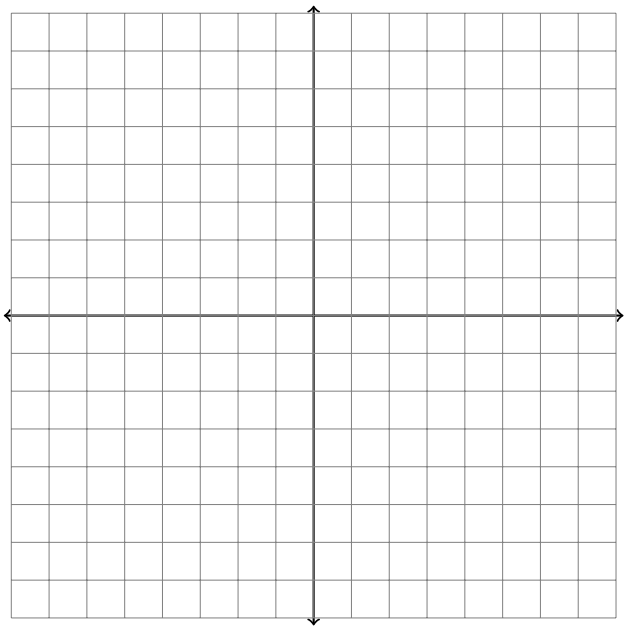
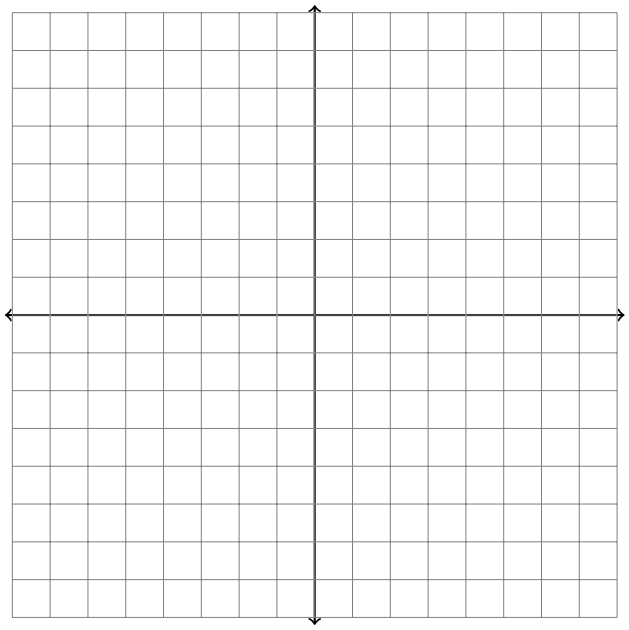
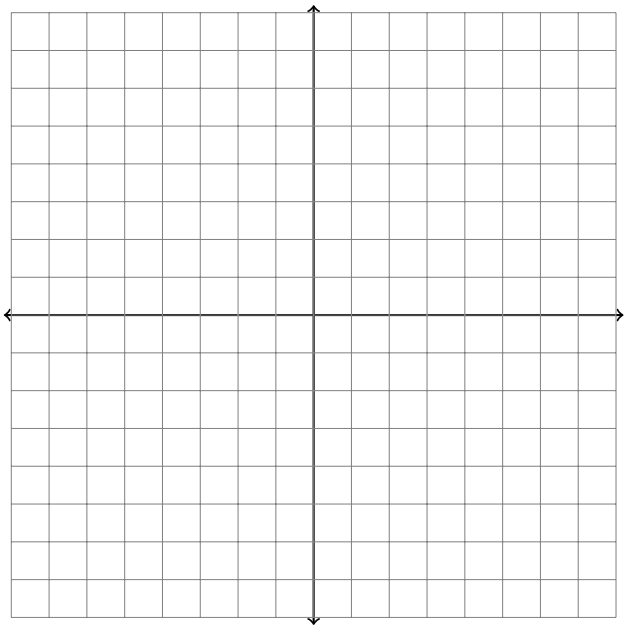
(b) Draw the graph of the equation $x^2 + (y-1)^2 - 1 = 0$.



(c) Draw the graph of the equation $xy = 0$.



(d) Draw the graph of the equation $x^2 + y^2 = 0$.



8. Sketch graphs of the following functions: (a) $y = |x| + 1$, (b) $y = |x + 1|$, (c) $y = |x - 5| + 1$