Algebra 1 Practice Problems II

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1 Graphing

1. Draw a coordinate plane and label the origin and the four quadrants.
2. Let $A = (3, 1)$. Find the coordinates of each of the following:
   (a) the reflection of A across the x-axis
   (b) the rotation of A around the origin by $180°$
   (c) the rotation of A around the origin by $90°$ counterclockwise
   (d) the reflection of A across the y-axis
   (e) the reflection of A across the line $y = x$
   (f) the rotation of A around the point $(2, 2)$ by $90°$ clockwise
3. The points $(5, 7)$ and $(8, -1)$ lie on the line with equation $y = mx + b$, where m and b are constants. Find m and b.
4. Which of the following expressions correctly finds the slope between the points $(-1, 7)$ and $(3, -4)$? Circle all that apply.
5. Let $A = (1, 1)$, $B = (5, 2)$, and $C = (-4, 3)$. In this problem, we will find the coordinates of the point D for which quadrilateral $ABCD$ is a parallelogram.
   (a) Find the slopes of lines AB and BC.
   (b) Write down an equation for the line through C parallel to AB.
   (c) Write down an equation for the line through A parallel to BC.
   (d) Since $AB \parallel CD$ and $AD \parallel BC$, point D must be the intersection of the lines you found in parts (b) and (c). Use this to find the coordinates of point D.
6. (a) Of the equations
   $$5x + 4y = 35; \quad (x + 4)^2 + (y - 1)^2 = 10; \quad x^2 + xy + y^2 = 49; \quad x - 2y = -7,$$
   which one is an equation for the blue line below?

(b) Of the equations

$$5x + 4y = 35; \quad (x+4)^2 + (y-1)^2 = 10; \quad x^2 + xy + y^2 = 49; \quad x - 2y = -7,$$

which one is an equation for the red curve below?