1. (a) Find an equation of the line through the points $(-2, 1)$ and $(4, 3)$.

   The line has sloped $\frac{3-1}{4-(-2)} = 1/3$ and goes through $(-2, 1)$ (for instance) so it has the equation $y - 1 = (x + 2)/3$.

   (b) Find an equation of the line with slope 1 that goes through the point $(2, 3)$.

   $y - 3 = x - 2$

   (c) What is the point of intersection of the lines from parts (a) and (b)? Sketch both lines on the axes below.

   The first line can be written as $y = x/3 + 5/3$ and the second line as $y = x + 1$. If (x, y) is on both lines, then

   $$y = x/3 + 5/3 = x + 1, \quad 2x/3 = 2/3, \quad x = 1 \text{ and } y = 2.$$
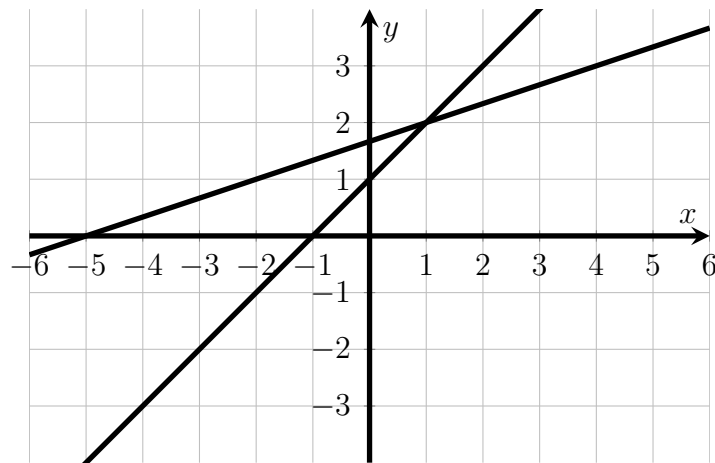
2. Solve the following equations:

   (a) $3 + 2\log_7(x^2 - 3x + 9) = 5$

$$2\log_7(x^2 - 3x + 9) = 2$$
$$\log_7(x^2 - 3x + 9) = 1$$
$$x^2 - 3x + 9 = 7$$
$$x^2 - 3x + 2 = 0$$
$$(x - 1)(x - 2) = 0$$
$$x = 1, 2$$

   (b) $2 + 5^{3x-6} = 127$

$$5^{3x-6} = 125 = 5^3$$
$$3x - 6 = 3$$
$$x = 3$$

3. Consider the function $f(x) = \dfrac{3x + 2}{4x + 3}$.

   (a) What is the domain of f?

   $x \neq -3/4$

   (b) Find $f^{-1}(x)$ (i.e., solve $y = \dfrac{3x + 2}{4x + 3}$ for x and switch the roles of y and x).
   What is the domain of f^{-1}?

$$y = \frac{3x + 2}{4x + 3}$$
$$4xy + 3y = 3x + 2$$
$$x(4y - 3) = 2 - 3y$$
$$x = \frac{-3y + 2}{4y - 3}$$
$$f^{-1}(x) = \frac{-3x + 2}{4x - 3}$$

The domain of f^{-1} is $x \neq 3/4$.