preIB exercises

1. Find the equation of the line passing through the following pairs of points:
   (a) $A = (1, 4),\ B = (3, 8)$;
   (b) $A = (-2, 0),\ B = (2, 2)$;
   (c) $A = (1, \frac{3}{2}),\ B = (5, \frac{7}{2})$;
   (d) $A = (2, 5),\ B = (2, -3)$.

2. Find the equation of the line passing through the given point and **parallel** to the given line:
   (a) $A = (3, 5),\ \ l : y = 4x - 3$;
   (b) $A = (-1, 1),\ \ l : y = \frac{x}{2} + 3$;
   (c) $A = (-3, 2),\ \ l : y = 1$;
   (d) $A = (1, -2),\ \ l : 3y - 6x + 3 = 0$.

3. Find the equation of the line passing through the given point and **perpendicular** to the given line:
   (a) $A = (1, 6),\ \ l : y = \frac{x}{3} + 2$;
   (b) $A = (8, 1),\ \ l : y = 4x + 3$;
   (c) $A = (-3, 1),\ \ l : y = 2$;
   (d) $A = (4, 4),\ \ l : 2y + x + 1 = 0$.

4. Find the coordinates of the intersection of the following pairs of lines:
   (a) $l_1 : y = 2x - 1,\ \ l_2 : y = 3 - x$;
   (b) $l_1 : y = \frac{1}{2}x + 2,\ \ l_2 : y = 4x + 1$;
   (c) $l_1 : y = 2,\ \ l_2 : x = 1$;
   (d) $l_1 : 2y + 2x - 1 = 0,\ \ l_2 : y - x - 7 = 0$.

5. $f(x) = 4 - \frac{1}{2}x$. Sketch the graph of f. Find the points of intersection of the graph with both the x and the y-axis. For what values of x is the function positive?