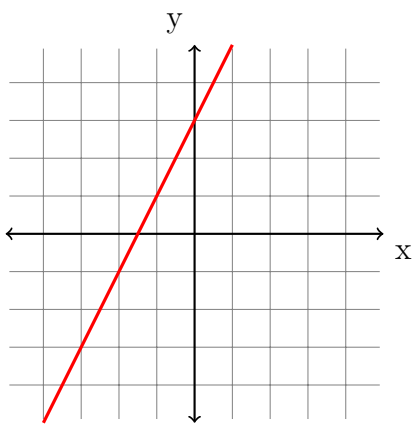
1. Consider the line given by $y = 2x + 3$.

   (a) Find five points on the line and arrange them in a table.
   Answers may vary. Possible answer:

x	y
-2	-1
-1	1
0	3
1	5
2	7

   (b) Graph the line.



   (c) Find the $x-$intercept and the $y-$intercept.
   $x-$intercept is $(-3/2, 0)$ and $y-$intercept is $(0, 3)$

2. Find the slope-intercept form of the equation of the line through the points $(-1, 4)$ and $(2, 7)$.
   $y = x + 5$

3. Consider the line passing through the point $(3, 4)$ with slope -1.

   (a) Write down the equation of the line in point-slope form.
   $y - 4 = -(x - 3)$

   (b) Write down the equation of the line in slope-intercept form.
   $y = -x + 7$

   (c) Find all intercepts.
   $x-$intercept is $(7, 0)$ and $y-$intercept is $(0, 7)$

4. Consider the line $y = 3x - 1$.

   (a) Find the equation of a parallel line through $(-2, 5)$.
   $y - 5 = 3(x + 2)$ or $y = 3x + 11$

(b) Find the equation of a perpendicular line through $(2, 4)$.
$y - 4 = -\frac{1}{3}(x - 2)$ or $y = -\frac{1}{3} + \frac{14}{3}$

5. Consider the line $3x - 2y = 6$.

(a) Find the slope and intercepts of the line.
slope is $\frac{3}{2}$, $x-$intercept is $(2, 0)$, and $y-$intercept is $(0, -3)$

(b) Find a point on the line and a point not on the line.
Answers may vary. Check that a point on the line *agrees* with the given equation, while a point not on the line *does not*.

(c) Write the equation of the line in slope-intercept form.
$y = \frac{3}{2}x - 3$

6. Find the point of intersection of the graphs of $-x + 3y = -24$ and $x + y = -8$.
$(0, -8)$

7. Solve:

$$\begin{cases} y & = 3x + 2 \\ 3x + 6y & = 12 \end{cases}$$

$(0, 2)$

8. Write down a system of two linear equations that has

(a) Exactly one solution
Any pair of non-parallel lines.

(b) No solution
Any pair of parallel lines.

(c) Infinitely many solutions
Any pair of lines whose equations could be reduced to the same equation.

9. Derive the point-slope form of the equation for a line by following these steps.

Step 1: Let L be the line passing through the fixed point (x_1, y_1) and an arbitrary point (x, y).

Step 2: Manipulate the general formula for the slope of L.

$$m = \frac{y - y_1}{x - x_1} \Longrightarrow y - y_1 = m(x - x_1)$$