

1. The equation of a line in *slope-intercept form* is  $y = mx + b$ . It is given this name because we can find the slope and y-intercept directly from the equation.
  - (a) For the line  $y = -3x + 5$ , what are the slope and y-intercept?
  - (b) Graph the line.
  
2. The equation of a line can also be written in *standard form*:  $Ax + By + C = 0$ . The most direct way to graph such a line is to find the  $x$  and  $y$  intercepts algebraically, then plot the line using those two points.
  - (a) For the line  $x - 3y - 15 = 0$ , find the two intercepts.
  - (b) On the same axes as your line from Question 1, graph this line.
  - (c) From your graph, what is the slope of this line?
  - (d) What is the geometrical relationship between this line and the line from Question 1? Explain your answer.
  - (e) From your graph, find the point of intersection of the two lines? Verify your answer using an algebraic method.
  
3. A graph or equation of a line can be determined from *any* two points, not just the two intercepts. Let point  $P$  be  $(2, 8)$  and let point  $Q$  be  $(-1, -10)$ .
  - (a) Find the slope of this line using the slope formula.
  - (b) Write the equation of the line in slope-intercept form, using  $b$  for the still-unknown value for the y-intercept.
  - (c) Find the value of  $b$ .
  - (d) On the same axes as your lines from Questions 1 and 2, graph this line.
  - (e) From your graph, find the point of intersection of this line and the line from Question 1. Verify your answer using an algebraic method.