**Problem**

**Introduction.** For any choice of numbers for *m* and *b*, we get a line in the *x*-*y*-plane given by the equation

*y* = *m*x + *b.*

But a value for *m* and a value for *b* also determines a point in the *m*-*b*-plane.

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| **Figure 1.**  The lines *y =* 2*x*+3, *y =* 5*x*-2 and  *Y =* -(1/2)*x* +1in the *x*-*y*-plane. | **Figure 2.** The points (2,3), (5,2) and (-1/2, 1) in the *m*-*b*-plane. |

We see this way that every point in the *m*-*b*-plane determines a line in the *x*-**y**-plane and every non-vertical line in the *x*-*y*-plane determines a point in the *m*-*b*-plane.

A line in the *m*-*b*-plane is a collection of *m*-*b*-points. Each such point determines a line in the *x*-*y*-plane. So a line in the *m*-*b*-plane determines a family of lines in the *x*-*y*-plane.

**Problem 1.** Let *b* = 3 *m* + 5 be a line in the *m*-*b*-plane. What is the corresponding family of lines in the *x*-*y*-plane?

**Problem 2.** Every non-vertical line in the *m*-*b*-plane has an equation of the form *b* = S *m* + T. Describe the corresponding family of lines in the *x*-*y*-plane in terms of *S* and *T*.