**Exercise 14.5**: A translation is \( x' = x + a, y' = y + b \), where \( a, b \in \). Let \( a_1 = 1, b_1 = 0, c_1 = a \) and \( a_2 = 0, b_2 = 1, c_2 = b \). Then we have \( x' = a_1 x + b_1 y + c_1; y' = a_2 x + b_2 y + c_2 \) and \( a_1 b_2 \neq a_2 b_1 \).

A rotation is \( x' = x \cos \theta + y \sin \theta, y' = -x \sin \theta + y \cos \theta \), where \( \theta \in [0, 2\pi) \). Let \( a_1 = \cos \theta, b_1 = \sin \theta, c_1 = 0 \) and \( a_2 = -\sin \theta, b_2 = \cos \theta, c_2 = 0 \). Then we have \( x' = a_1 x + b_1 y + c_1; y' = a_2 x + b_2 y + c_2 \) and \( a_1 b_2 \neq a_2 b_1 \).

A reflection on the \( x \)-axis is \( x' = -x, y' = y \). Let \( a_1 = -1, b_1 = 0, c_1 = 0 \) and \( a_2 = 0, b_2 = 1, c_2 = 0 \). Then we have \( x' = a_1 x + b_1 y + c_1; y' = a_2 x + b_2 y + c_2 \) and \( a_1 b_2 \neq a_2 b_1 \).

A reflection on the \( y \)-axis is \( x' = x, y' = -y \). Let \( a_1 = 1, b_1 = 0, c_1 = 0 \) and \( a_2 = 0, b_2 = -1, c_2 = 0 \). Then we have \( x' = a_1 x + b_1 y + c_1; y' = a_2 x + b_2 y + c_2 \) and \( a_1 b_2 \neq a_2 b_1 \).

A reflection with respect to the origin is \( x' = -x, y' = -y \). Let \( a_1 = -1, b_1 = 0, c_1 = 0 \) and \( a_2 = 0, b_2 = -1, c_2 = 0 \). Then we have \( x' = a_1 x + b_1 y + c_1; y' = a_2 x + b_2 y + c_2 \) and \( a_1 b_2 \neq a_2 b_1 \).

General reflections (on a straight line) and scale changes are left to the reader.