Pat throws a ball up the side of a hill. The path of the ball is shown as a parabola, with the highest point of the trajectory at the point (10, 30) in the coordinate system shown. The hill is modeled by the two lines shown; one line is horizontal and the other passes through the origin. The two lines meet at the point (12, 24). The hill and the trajectory of the ball both cross the origin of the coordinate system.

1 (4 points) Find the equation of the parabola that models the path of the ball.

2 (3 points) Find the multi-part function that models the hill. (Use a domain of $0 \leq x \leq 20$.)
3 (4 points) Find the multi-part function that models the height of the ball above the hill. (Use a domain of $0 \leq x \leq 14$. This is before the ball hits the hill.)

4 (4 points) Find the $x$ coordinate where the ball has its greatest height over the hill. (You do not need to find this greatest height.)