

5. [9 points] Danica is tossing her wadded-up notes into a wastebasket across the room. The height above the ground of one particular wad,  $H$  (in feet), can be expressed as a function of the horizontal distance,  $d$  (in feet), from where Danica releases the wad of paper using the following function:

$$H = -\frac{1}{4}(d^2 - 4d - 12)$$

- a. [2 points] Find the value of the vertical intercept and interpret its meaning in the context of the problem.

**Answer:** Vertical intercept: \_\_\_\_\_

**Interpretation:**

- b. [3 points] The rim of the wastebasket is 1.5 feet above the ground and 7 feet horizontally from where Danica released the wad of paper. Using this information, can you tell whether Danica succeeds in throwing the wad into the wastebasket?  
*Show all calculations and justify your conclusion with one sentence.*

**Answer** (*circle one*):      She succeeds      She fails      Cannot be determined

**Justification:**

- c. [4 points] What is the highest point above the ground the wad reaches? Include units.  
*There are at least two methods you could use here: finding the axis of symmetry using the zeros or completing the square.*

**Answer:** \_\_\_\_\_