

8. [12 points] For Thanksgiving, Bert is trying to make a festive feast table using fall-colored cloth and other accessories. The cloth costs \$0.25 per square foot and the accessories are \$0.50 each. He decides the impact of the festive table, I , is a function of the number of square feet of cloth, c , that he uses and the number of accessories, a , that he uses. This relationship is given by

$$I = c \left(\frac{1}{2}a - 3 \right)^2.$$

Bert has a total budget of \$9 for the cloth and accessories.

- a. [2 points] Write an equation which expresses that the total cost of the cloth plus the accessories for the festive table is \$9.
- b. [10 points] Use your answer from (a) to find the maximum impact of the festive table that is possible for \$9, as well as how many accessories and how much cloth is needed to achieve the maximum impact. Be sure to show your answer is indeed the maximum.

maximum impact: $I =$ _____

$c =$ _____

$a =$ _____