Name: KEY Date: _____

MODELING WITH SYSTEMS OF EQUATIONS

APPLICATIONS

1. A local theater is showing an animated movie. They charge $5 per ticket for a child and $12 per ticket for an adult. They sell a total of 342 tickets and make a total of $2550. We want to try to find out how many of each type of ticket they sold. Let c represent the number of children's tickets sold and a represent the number of adult tickets sold.

   (a) Write an equation that represents the fact that 342 total tickets were sold.

   $-5(c + a = 342)$

   (b) Write an equation representing the fact that they made a total of $2550.

   $5c + 12a = 2550$

   (c) Solve the system you created in (a) and (b) by the Method of Elimination.

   $-5c - 5a = -1710$
   $5c + 12a = 2550$
   $7a = 840$
   $\frac{7a}{7} = \frac{840}{7}$
   $a = 120$

   $c + 120 = 342$
   $-120 \quad -120$
   $c = 222$

   222 children's tickets
   120 adult tickets

2. A catering company is setting up tables for a big event that will host 764 people. When they set up the tables they need 2 forks for each child and 5 forks for each adult. The company ordered a total of 2992 forks. Set up a system of equations involving the number of adults, a, and the number of children, c, and solve to find out how many of each attended the event.

   $-2(a + c = 764)$
   $5c + 5a = 2992$
   $-2a - 2c = -1528$
   $\frac{3a}{3} = \frac{1464}{3}$
   $a = 488$

   $488 + c = 764$
   $-488 \quad -488$
   $c = 276$

   276 children
   488 adults

3. Ilida went to Minewaska Sate Park one day this summer. All of the people at the park were either hiking or bike riding. There were 178 more hikers than bike riders. If there were a total of 676 people at the park, how many were hiking and how many were riding their bikes?

   $h + b = 676$
   $h - b = 178$
   $\frac{2h}{2} = \frac{854}{2}$
   $h = 427$

   $427 + b = 676$
   $-427 \quad -427$
   $b = 249$

   427 hikers
   249 bikers