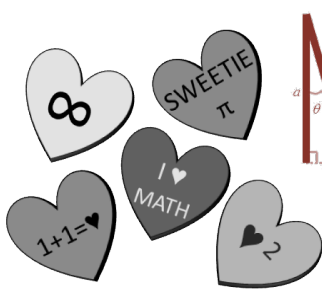


Name: _____

Hour: _____



Valentine's Day

Valentine's Day's origin, and its association with love, is debatable. One theory suggests that the celebration originated from an early Roman festival named Lupercalia, which was later renamed in honor of Saint Valentine. Saint Valentine was allegedly killed on February 14th, 273 AD in Rome, Italy, for performing marriages in secret (against the Emperor Claudius' ban on marriages). Centuries later, Charles, Duke of Orleans, was credited with sending the first Valentine's Day card. While imprisoned in the Tower of Agincourt in 1415, he wrote a poem to his wife.

In more modern times, the first mass-produced valentines were created and sold shortly after 1847, by Esther Howland. The cards were sold through her father's company, S.A. Howland & Sons, which was the largest book and stationery store in Worcester, Massachusetts. Since then, the popularity of Valentine's Day cards has grown dramatically. Today, in the United States, about 190 million Valentine's Day cards are sent each year. This number does not include valentines exchanged in school activities, which is approximately 800 million additional cards.

Esther Howland's original sales totaled approximately \$5,000, but the industry has grown to approximately \$19 billion today, which includes flowers, chocolates, jewelry, and other gifts.

Questions:

- 1) Assume the industry growth of Valentine's Day has been linear from starting in 1847 with \$5,000 in sales to 2017 with \$19,000,000,000 in sales.
 - a. What is the annual growth rate in dollars/year (round to the nearest penny)?
 - b. Write a linear equation for the total sales associated with Valentine's Day, where x represents the number of years since 1847.
 - c. Use your equation from part b to predict the total sales associated with Valentine's Day in the year 2047.
- 2) Hallmark and American Greetings are the two companies in the United States that sell the most Valentine's Day cards. Assume a local store sells both brands of cards. On February 10, the store sold 15 of the same Hallmark brand card and 10 of the same American Greetings brand card, for a total of \$105.75. On February 11, the same store sold the 25 of the same Hallmark brand card and 15 of the same American Greetings brand card for a total of \$168.60. Create and solve a system of equations to determine the cost of the Hallmark brand card and the American Greetings brand card, where x represents the cost of the Hallmark brand card and y represents the cost of the American Greetings brand card.

- 3) Two local flower shops, Dancing Daisies and Trendy Tulips, are selling dozen-rose-bouquets for Valentine's Day. Dancing Daisies charges \$25 for each dozen-rose-bouquet, while Trendy Tulips charges \$30 for each dozen-rose-bouquet. By noon on Valentine's Day, Dancing Daisies has sold \$600 worth of dozen-rose-bouquets and Trendy Tulips had sold \$300 worth of dozen-rose-bouquets. Create and solve a system of linear equations for the local flower shops, where x represents the number of additional dozen-rose-bouquets each store will sell after noon on Valentine's Day and y represents the amount of money in dozen-rose-bouquet sales.
- 4) The average American will spend \$147 on Valentine's Day gifts this year. To pay for a gift for her boyfriend, Jen works two jobs - one job as a babysitter and the other job as a dog walker. She earns \$10 per hour as a babysitter and \$8 per hour as a dog walker. The two weeks before Valentine's Day, Jen worked a total of 19 hours and earned \$168. Create and solve a system of equations, where x represents the number of hours Jen worked as a babysitter and y represents the number of hours Jen worked as a dog walker.