Writing a System of Equations to Solve Problems

Name: Key

Notes 1

r each problem, define the variables and then write a system of equation then solve.

1) Katherine is deciding which catering company she should use for Mom's 50th birthday party. At Bashful's Birthday Blast there is a fee of $20.00 and a charge of $9.00 per person. At Bertha's Ballroom Blitz there is a fee of $100 and a charge of $5.00 per person. For how many people will the cost become equal? What is that cost?

Identify the Variables: $x = $ # of people $x = $ total cost

$y = y$

Bashfuls
$y = 20 + 9x$

Bertha's
$y = 100 + 5x$

$20 + 9x = 100 + 5x$
$4x = 80$
$x = 20$

$y = 20 + 9(20)$
$y = 20 + 180$
$y = 200$

$(20, 200)$

At 20 people it will cost $200

2) Two companies sell stock shares on Wall Street. Losers Incorporated stock starts with a value of $39.63 and loses $0.08 for each new stockholder. The "Be Rich with Us" Corporation starts with a value of $24.45 and gains $0.03 in value for each new stockholder. At how many new stockholders will the value be equal? What is that value? (Solve by graphing)

$x = $ Stockholders $y = $ value

Losers
$y = 39.63 - 0.08x$

Be Rich
$y = 24.45 + 0.03x$

$(138, 28.6)$

at 138 stockholders both stocks will be worth $28.60

3) Farmer Peter and Farmer Paula are picking apples from their apple trees. Farmer Peter has already picked 287 apples. Farmer Peter picks another 5 apples each minute. Farmer Paula has already picked 154 apples. Farmer Paula picks another 6 apples each minute. After how many minutes will the number of apples be the same? How many apples would each farmer have picked? (Solve by graphing and algebraically)

$x = $ each minute $y = $ # of apples

Peter
$y = 287 + 5x$

Paula
$y = 154 + 6x$

$y = y$
$287 + 5x = 154 + 6x$
$133 = x$

$(133, 952)$

$y = 154 + 6(133)$
$y = 154 + 798$
$y = 952$

After 133 minutes they each picked 952 apples