Algebra 1: 6.1 (Part 1) HW **Name** Answer Key **Period** _____
Solving Systems by Graphing

Write a system of linear equations to represent each scenario. Define each variable. Then, graph the system of equations. Use the graph to estimate the break-even point, then calculate the exact break-even point. Explain what the break-even point represents with respect to each scenario. Round to the 100th place.

1. Diamond sets up a lemonade stand in front of her house. Each cup of lemonade costs Diamond $0.30 to make, and she spends $6 on the advertising signs she puts up around the neighborhood. She sells each cup of lemonade for $1.50.

x = # of cups of lemonade

Income equation:

$y = 1.50x$

Expense equation:

$y = 0.3x + 6$

Break-even Point estimate: (Pt of intersection)

$x = 5$ or $(5, 7.5)$

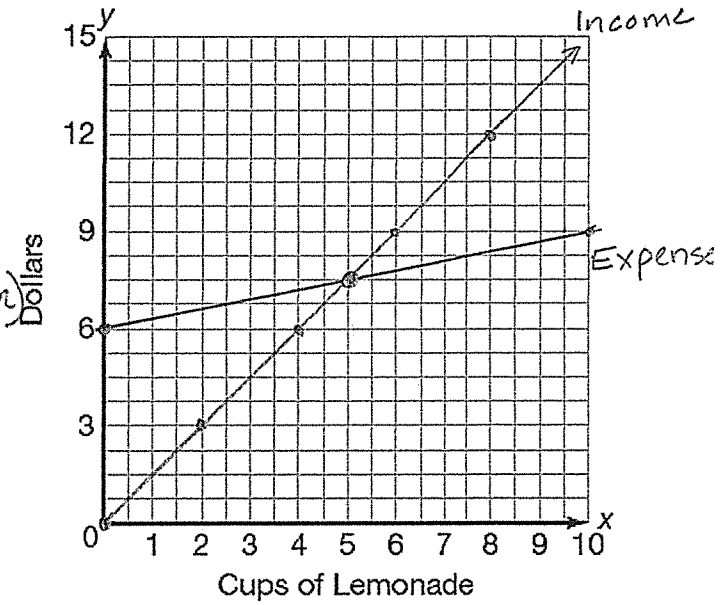
Break-even Point exact:

$y = 1.50x$ and $y = 0.3x + 6$

$1.50x = 0.3x + 6$

$1.2x = 6$

$x = 5$



What does the break-even point represent?

Diamond must sell 5 cups of lemonade to break-even, Her income and expenses will be $7.50.

2. Tyler starts his own lawn mowing business. He spends $180 on a new lawnmower. For each yard he mows, he receives $20 and spends $4 on gas.

x = # of yards he mows

Income equation:

$y = 20x$

Expense equation:

$y = 4x + 180$

Break-even Point estimate:

x is between 11 and 12

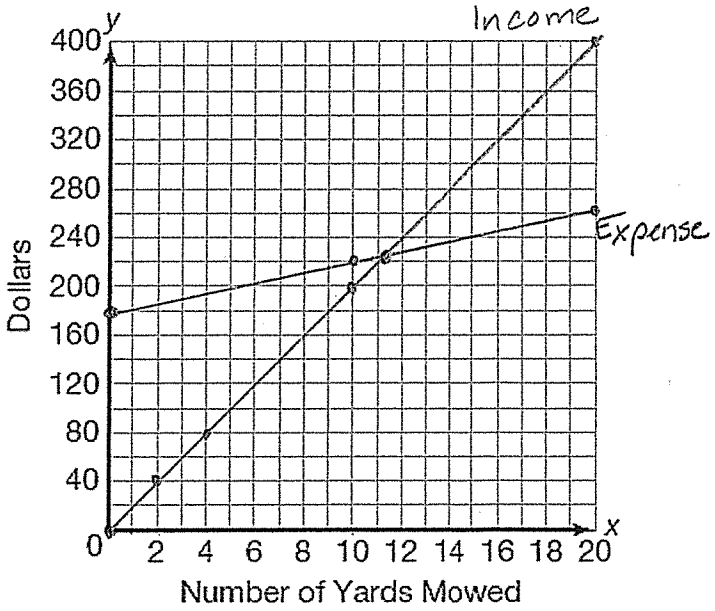
Break-even Point exact:

$y = 20x$ and $y = 4x + 180$

$20x = 4x + 180$

$16x = 180$

$x = 11.25$



What does the break-even point represent?

Tyler must mow between 11 and 12 yards to break-even. Her income and expenses will be $225.

3. Mareshah is building birdhouses to raise money for a trip to Hawaii. She spends $30 on the tools needed to build the houses. The material to build each birdhouse costs $3.25. Olivia sells each birdhouse for $10.

x = # of birdhouses

Income equation:

$y = 10x$

Expense equation:

$y = 3.25x + 30$

Break-even Point estimate:

x is between 4 and 5

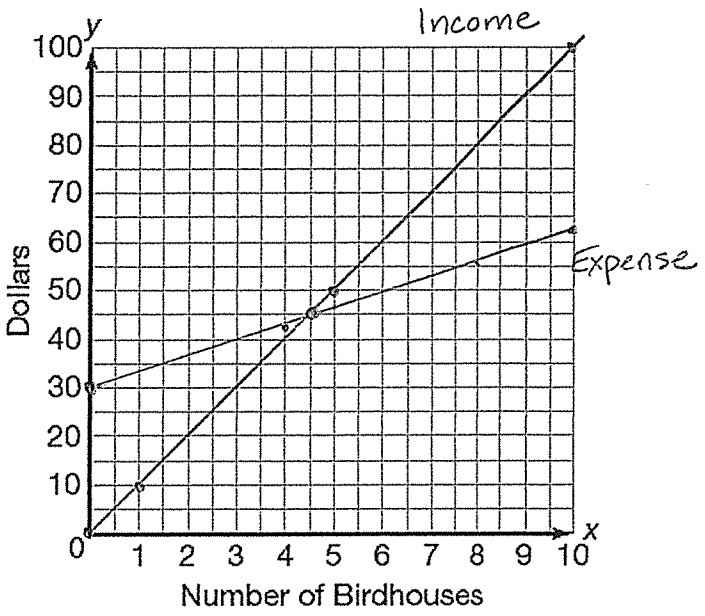
Break-even Point exact:

$y = 10x$ and $y = 3.25x + 30$

$10x = 3.25x + 30$

$6.75x = 30$

$x = 4.44$



What does the break-even point represent?

Mareshah must build between 4 and 5 birdhouses to break-even. Her income and expenses will be $44.44

4. The Spanish Club is selling boxes of fruit as a fundraiser. The fruit company charges the Spanish Club $7.50 for each box of fruit and a shipping and handling fee of $100 for the entire order. The Spanish Club sells each box of fruit for $15.

x = # of boxes of fruit

Income equation:

$y = 15x$

Expense equation:

$y = 7.5x + 100$

Break-even Point estimate:

x is between 13 and 14

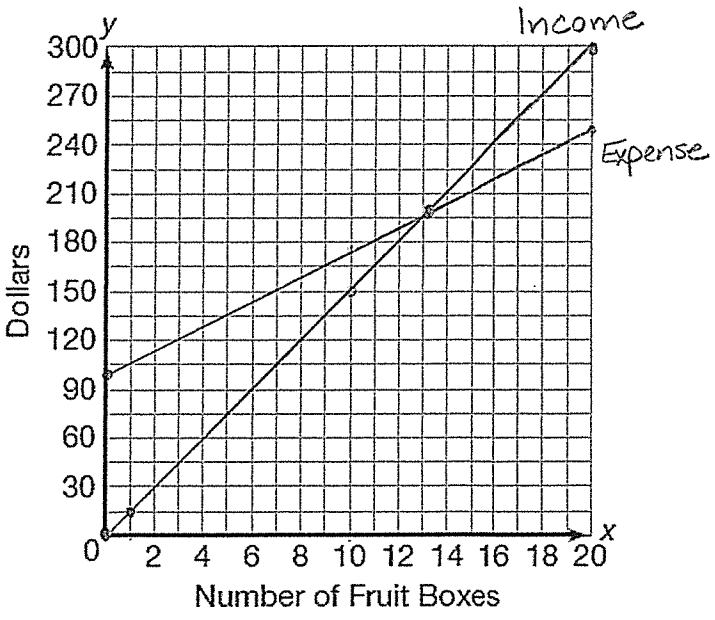
Break-even Point exact:

$y = 15x$ and $y = 7.5x + 100$

$15x = 7.5x + 100$

$7.5x = 100$

$x = 13.33$



What does the break-even point represent?

The Spanish Club must sell between 13 and 14 boxes of fruit to break-even. Their income and expenses will be $200.