Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Investigation 13: **What Is the Expected Cost to Raise a Child?**

**Worksheet 13.3 Application of Expected Value**

**Scenario**

The high school band is selling raffle tickets to raise money for new uniforms. The winner of the random drawing will receive a necklace designed and made by one of the band parents. The raffle tickets cost $1 and the necklace has a value of $100. The band sells 200 tickets.

Let G represent the amount gained if you buy one ticket.

There are two possible outcomes – you win or lose. If you lose then you have lost your $1, which can be a gain of -1. If you win your gain would be 100 minus the 1 for the ticket or a gain of $99.

1. If a person buys 1 raffle ticket, find the probability distribution for the gain/loss.

|  |  |
| --- | --- |
| *Gain/loss* | *Probability of Gain/loss* |
| *-$1* |  |
| *$99* |  |

1. Find the expected gain/loss for a player who buys 1 raffle ticket.
2. What would the expected gain/loss be if a person bought 10 tickets?

|  |  |
| --- | --- |
| *Gain/loss* | *Probability of Gain/loss* |
| *-$10* |  |
| *$90* |  |

1. What would the expected gain/loss be If person bought 100 tickets? Can you find the answer without creating a probability distribution?