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

***Variables and Patterns***

**Investigation 3.3**

***Labsheet***

 Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_



Liz and Theo want to visit Wild World with their

friends. Theo checks if the park offers special

prices for groups larger than 3 people. He finds

this information on the park’s Web site:

**A.** Study the rule.

**1. a.** Complete the table to show the admission price for groups of size 4, 8,

 12, 16, 20, 24, 28, 32, 36, and 40 people.

**Wild World Admission Prices**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Number in Group** | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| **Price** |  |  |  |  |  |  |  |  |  |  |

Then sketch a graph of the data on the coordinate grid below.

**Wild World Admission Prices**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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 **b.** Describe the pattern of change that

 shows up in the table and graph.

**2. a.** Describe in words how you can calculate the admission price for a group with

any number of people.

 **b.** Write an equation relation admission price, p, to group size, n.

**c.** How is this pattern of change in prices for group admission similar to the pattern of change for the equations in problem 3.2?

 How is it different?

**3. a.** Describe how you can use the table, graph or equation to find the cost for 18 people.

**b.** Describe how you can use the table or graph to find the number of people in the group if the total charge is $350 or $390?

**B.** Admission to Wild World includes a bonus card with 100 points that can be spent
on rides. Rides cost 6 points each.

**1.** Complete the table below to show a customer’s bonus card balance after various numbers of rides.

**Bonus Card Balance**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Number of Rides** | 0 | 1 | 2 | 3 | 5 | 7 | 10 | 15 |
| **Points on Card** | 100 |  |  |  |  |  |  |  |

 **2.** Explain how you can calculate the number of points left after any number of rides.

**3.** Write an equation showing the relationship between points left
on the bonus card and number of rides taken.

**4.** How does cost per ride appear in the equation?

 How does the number of bonus points at the start appear in the equation?

**5.** Sketch a graph of the relationship between points left and
number of rides for up to 20 rides.

**Bonus Card Balance**

Describe the relationship between the variables.

**C.** Liz wonders whether they should rent a cart to carry their backpacks.

The equation *c* = 20 + 5*h* shows the cost in dollars *c* of renting a cart for *h* hours.

 **1.** What information does each number and variable in the expression 20 + 5*h* represent?

 **2.** Use the equation to complete the table below showing the cost of renting a cart for 0, 1, 2, 3, 4, 5, and 6 hours.

**Golf Cart Rental**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Number of Hours** | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| **Rental Cost** |  |  |  |  |  |  |  |

Then make a graph of the data on the coordinate grid below.

**Golf Cart Rental**

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**3.** Explain how the cost per hour shows up in the table, graph, and equation.

**4.** Explain how the 20 in the equation is represented in the table and in the graph.

**5.** Which of the following points satisfy the relationship represented by the equation? Explain your reasoning.

(0, 4) (0, 20) (7, 55)