Name: _____ **Project Grade:** _____/100

Math Summer Packet for rising 8ᵗʰ graders

This summer you'll practice how to recognize patterns in order to make a prediction. The patterns can be found on a table or a graph.

Essential Question:

If two contestants on the Biggest Loser track their weight loss progress, can you make a prediction to determine which one is going to win by the show's finale?

PART 1 – Investigation Problems

Recognizing Patterns on a **TABLE**

Directions: Choose <u>one</u> of the following levels and identify the number pattern to complete the tables. Are the numbers increasing or decreasing? What is the rule? Use the example provided.

LEVEL 1 – Easy piece

<u>RULE</u>

1) | 2 | 4 | 6 | 8 | 10 | | | | | |

_____

2) | 17 | 19 | 21 | 23 | 25 | | | | | |

_____

LEVEL 2 – I got this!

<u>RULE</u>

1) | −11 | −9 | −7 | −5 | −3 | | | | | |

_____

2) | 4 | 8 | 12 | 16 | 20 | | | | | |

_____

Unit Rate from a TABLE

Now you are going to use the skill of recognizing a pattern in a table with *two variables*. The following table shows Angela's travel to school.

Can you find out how many <u>miles she</u> travels <u>each</u> <u>day</u>?

Notice that the question is asking for MILES EACH DAY or MILES PER DAY. We call this a **unit rate**, meaning the number of miles Angela is traveling per <u>one day</u>.

Angela's Travel

Time (days)	2	4	6	8	10	12
Distance (miles)	10	20	30	40	50	60

1. Describe the pattern for the variable <u>TIME</u>? Is it **increasing/decreasing**? What is the **rule**? What is the **unit of measurement**? Note: Complete the statement below.

Answer: I notice that the time is _____. The rule followed is_____

_____. The unit of measurement used is_____.

2. Describe the pattern for the variable <u>DISTANCE</u>? Is it **increasing/decreasing**? What is the **rule**? What is the **unit of measurement**? Note: You can use the statement pattern above in answering this question.

Answer:_____

_____

3. In order to calculate the number of MILES PER DAY Angela travels, we need the following:

<u>Miles</u>   <u>Rule for Miles</u> = _____
Day   Rule for Days

Angela travels at a rate of _____ miles/day.

4. Can you make a prediction of how many miles will Angela travel the first 15 days of school? Explain how you got your answer using complete sentences and showing your solutions.
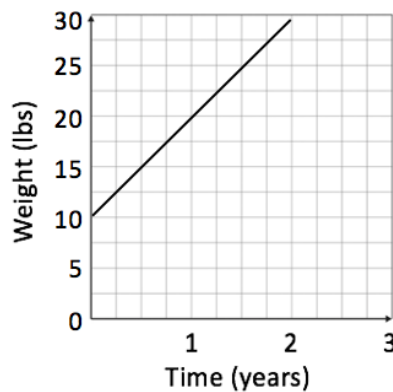
Time (Day)															
Distance (Mile)															

Answer: _____

_____

Recognizing Patterns on a **GRAPH**

Identify if the values of the following graphs are increasing or decreasing and make a prediction. Explain in your own words what patterns you see to justify your answer.

Example 1. The graph represents how much weight Ms. Kuoh's son, Andres, has gained since he was born.

1. Describe the pattern for the variable **TIME**? Is it **increasing/decreasing**? What is the **rule** and how did you calculate it? Note: Complete the statement to express your answer.

Answer: I notice that time is _____. The rule is _____.

_____. I calculated it by_____.

2. Is **TIME** a <u>dependent</u> or <u>independent</u> variable? How do you know? (Hint: look at the axis)

Note: The independent variable belongs on the x-axis (horizontal line) of the graph and the dependent variable belongs on the y-axis (vertical line).

Answer: Time is a/an _____variable because_____

_____.

3. Describe the pattern for the variable **WEIGHT**? Is it **increasing/decreasing**? What is the **rule** and how did you calculate it? Note: You can use the statement pattern used in question 1.

Answer:_____

_____

4. Is **WEIGHT** a **dependent** or **independent** variable? How do you know?(Hint: look at the axis).

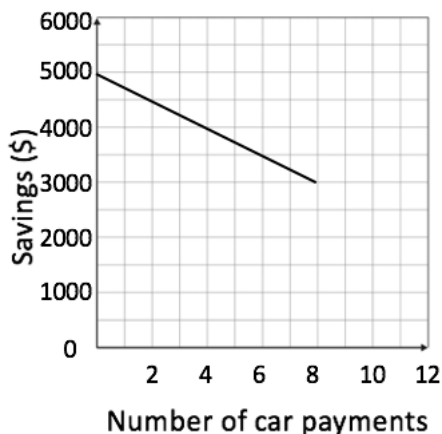   Note: You can use the statement pattern used in question 3.

Answer:_____

_____

5. How much will Andres weigh when he is 3 years old? Explain how you got your answer using complete sentences and examples. Complete the table.

Time (Years)			
Weigh (lbs)			

Answer: Andres will weigh_____lbs when he becomes 3 years old because_____

_____

_____

Example 2. The graph represents how much Ms. Ana's savings are going down by spending money on a car payment.

1. Which variable is **increasing** and what is its **rule**? Explain how you know using complete sentences.

Answer: The increasing variable is_____because_____

_____The rule is _____

_____

2. Which variable is **decreasing** and what is its **rule**? Explain how you know using complete sentences. Note: You can use the statement pattern in question 1.
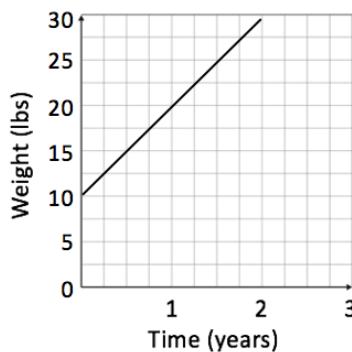
Answer: _____

_____

_____

3. **How many car payments** can Ms. Ana make, before she runs out of savings? Explain how you got your answer using complete sentences and examples.

Answer: Ms. Ana can make_____car payments before she runs out of savings. As

shown in the graph her savings_____.

_____

Unit Rate from a GRAPH

Using the graph from **below** we can calculate the unit rate from a graph (POUNDS PER YEAR).

1. What is the rule for Time (years)? By how much is increasing?

Answer: The rule for time is_____. It is increasing

by_____.

2. What is the rule for Weight (pounds)? By how much is increasing?

Answer:_____
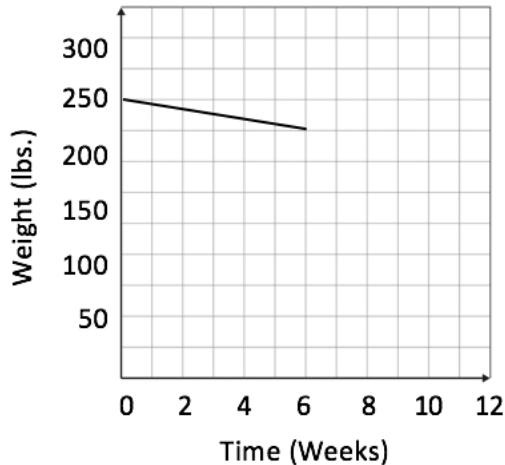
_____

3. Calculate the **unit rate** for *Example 1*:

Pounds   Rule for Pounds = _____
Year   Rule for Year

PART 2 – Essential Question

Two contestants on the Biggest Loser are Valerie and Oscar. Their weight loss progress is shown below.

Valerie's weight loss is shown on the graph below.	Oscar's weight loss is tracked in the table below.

Weeks	0	2	5	6
Weight	247	243	237	235

a) Who weighed more at the beginning of the show? Explain why using complete sentences.

Answer: _____weighted more at the beginning of the show. As shown in the graph,_____.

b) Who is losing weight faster? Use your unit rate knowledge and explain why using complete sentences.

Answer:_____is losing weight faster. As shown in the table, _____.

c) Who will win the show after **12 weeks**? Explain your answer using a complete sentence.

Answer: _____will win the show after 12 weeks because_____ _____.