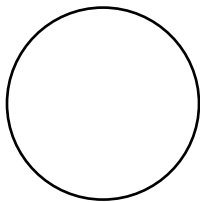


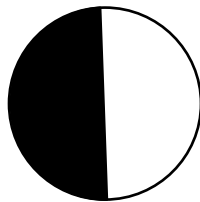
Name: _____ Teacher: _____ Period: _____

Phases of the Moon

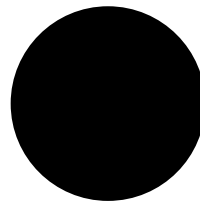
In your college astronomy class, you were given the task of measuring the phases of the moon from a full moon at 100% illumination and a new moon at 0%. You started with measuring the moon at 100% full. One week later the moon is 50% full, and two weeks after you started, the moon is 0% full. The table below shows the data that you collected.



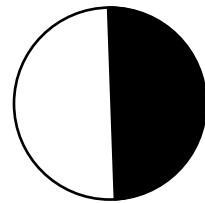
Full Moon



First Quarter



New Moon

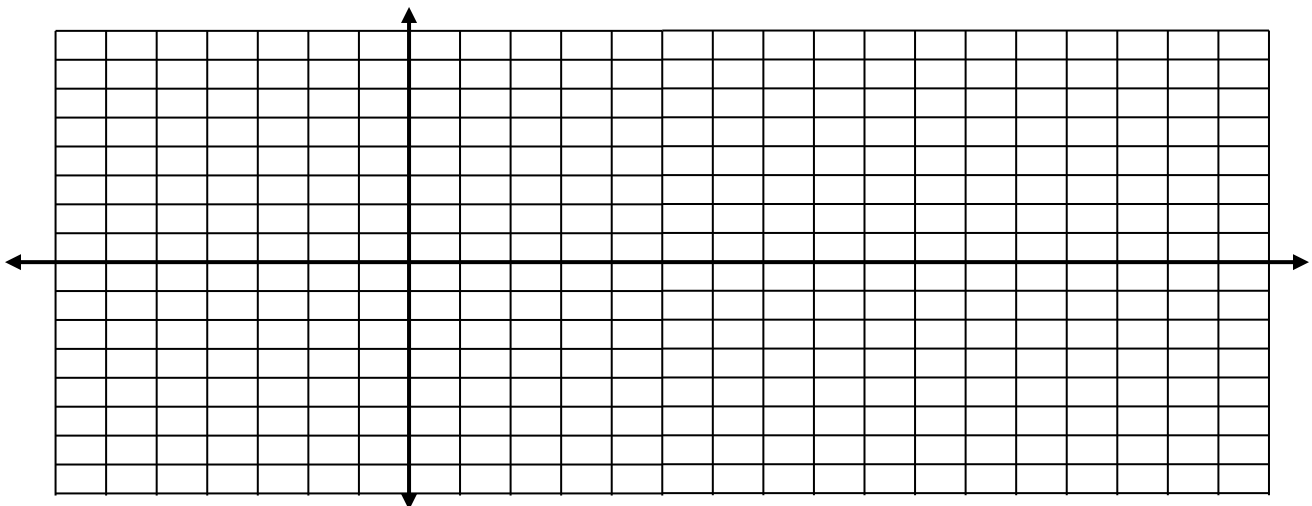


Last Quarter

Week	0	1	2	3	4	5	6	7	8	9	10
Illumination	100%	50%	0%	50%	100%	50%	0%	50%	100%	50%	0%

Part 1

Plot the data from the table using the coordinate axes below.



Part 2

What type of function best represents the data? Explain how you know.

Algebra 2 Performance Task #2

(2013-14)

Part 3

What are all of the elements of the data or graph necessary to write a complete function that models this situation? Explain your reasoning.

Part 4

Write a function that models this situation. Show all work or explain your reasoning.

Part 6

Write a new function to model this situation, preferably using a parent function that is different from the one you chose to use for Part 4 (you may use the same parent function if you do not know how to use a different one). Explain why this function is equivalent to the one written in Part 4.

Algebra 2 Performance Task #2

(2013-14)

Rubric

	Mastery 4	Proficient 3	Developing Proficiency 2	Little or No Proficiency 1
Part 1	Graph is labeled and appropriately scaled, with all points plotted correctly.	All points are plotted correctly, without labels or with inaccurate scaling.	Graph shows some understanding of correct interpretation of the data.	Graph does not show any understanding of correct interpretation of the data.
Part 2	Response and explanation are accurate.	Response is accurate but explanation is flawed.	Answer is accurate but no explanation provided.	Answer is not accurate.
Part 3	Response includes amplitude, period, phase shift, and vertical shift with accurate explanations and appropriate vocabulary used.	Response includes amplitude, period, phase shift, and vertical shift. Explanations may be flawed.	Response includes two of the four elements needed, with explanations.	Response includes less than two correct elements or is lacking explanations.
Part 4	Equation is accurate with work shown or explained (work or explanations could be provided from Part 3 if calculated there).	Equation, with work shown or explained, is accurate except for one error.	Equation, with work shown or explained, is accurate expect for two errors.	Equation does not have at least two correct elements, with work shown or explained.
Part 5	Response includes an accurate calculation for illumination on Day 150, based on the function provided in Part 4. Response for Part (b) considers placement on the curve needing to be <u>after</u> a new or full moon.	Response includes an accurate calculation for illumination on Day 150, based on the function provided in Part 4. Response for Part (b) considers percent illumination but not placement on the curve.	Response uses an estimate from extending the table or the graph, without converting days to weeks. OR Response demonstrates some accurate but incomplete procedures with major error(s).	Response does not demonstrate understanding of how to use the graph or equation to find the illumination after 150 days.
Part 6	Equation uses a different parent function and is accurate with a complete explanation for why it is equivalent.	Equation is a transformation of the same parent function and is accurate with a complete explanation for why it is equivalent.	Response has evidence of correct procedures with some misunderstanding or major errors in implementation. OR Response is accurate with an incomplete explanation.	Response does not demonstrate evidence of any proficiency with correct procedures.