Calculus

CVUSD 10-day Extended Learning Plan

Day1-5

Complex Numbers Storybook

You will be creating a "children's book" detailing the complex number. Your book will contain: An introduction explaining what complex and imaginary numbers are (and how they differ). It would also be a wise idea to explain what "*i*" is. An example of each:

- What is the Imaginary Unit.
- Identify complex numbers and write their conjugates learning target
- Add, subtract, and multiply complex numbers.
- Simplify quotients of complex numbers

Detailed steps in each example explaining what is occurring and why? For example, why do you decide to multiply a fraction by it's complex conjugate? Illustrations and some sort of story element. Aren't "children's books entertaining? Have some sort of an entertainment value. For example, Jessica in Complex Number land where everything is not real."

Requirements:

- Minimum page requirement: 6 pages
- Color and attractive value (a minimum, every other page must contain an illustration related to your story)
- Book cover – you must be enticed to read your own book otherwise, others will not be; include a title and your name
- Story pages – At least one page per topic. Including the examples, directions and illustrations.
- Does your story and examples make sense? Would it make sense if you were reading it to a Math III student?

Day 6-10

Project: Create a Model of the Temperature Data to Plan a Family Vacation

Four members of a family are using a democratic approach to choose a vacation. Each family member wants to visit a different city. Your task is to create a model of the average monthly temperatures for all four cities on one graph, so the family can use this information to discuss the ideal location and time of year. The four cities chosen are Bar Harbor, Maine; Maui, Hawaii; Anchorage, Alaska; and Orlando, Florida.

Source: http://www.usclimatedata.com/

Bar Harbor - Maine	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	31	35	42	53	65	74	79	78	71	59	48	37
Average low in °F:	14	17	25	35	44	54	59	59	52	42	33	21
Av. precipitation in inch:	4.92	4.33	5.39	4.76	4.65	4.13	3.5	3.31	4.45	5.31	6.46	5.47

Maui, Hawaii	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	68	68	68	68	71	71	72	73	73	72	70	68
Average low in °F:	49	49	50	51	53	54	55	56	55	55	54	51
Av. precipitation in inch:	9.29	8.78	11.26	9.49	6.42	5.12	7.4	6.73	6.22	7.28	12.6	12.05

Anchorage - Alaska	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	23	27	34	44	56	63	65	64	55	40	28	25
Average low in °F:	11	14	19	29	40	48	52	50	42	29	17	13
Av. precipitation in inch:	0.75	0.71	0.59	0.47	0.71	0.98	1.81	3.27	2.99	2.05	1.14	1.1

Orlando - Florida	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	71	73	77	82	88	91	92	92	89	84	78	72
Average low in °F:	50	53	57	62	68	73	76	76	74	68	60	54
Av. precipitation in inch:	2.76	2.83	3.78	2.48	3.31	8.74	7.09	7.83	6.02	3.31	2.4	2.64

1. Graph the data.

2. Write a trigonometric equation for each city using the sine function that best models this situation.

3. Rewrite the equation using the cosine function using a cofunction identity.

4. Graph the function that approximates the data.

5. What features of the data are represented by a, b, h, and k in your equation? Explain the meaning of these values in context.

6. Set up an equation to solve for the times that the average monthly temperature reached a specific value within the range of the dataset.

7. Solve the equation. On how many dates in the domain of the dataset was this temperature reached?