Upward Bound Summer 2007 Final •

Part I: Basic statistics

On Sunday 08 July 2007 the Honolulu Advertiser ran an article covering the rising number of Micronesians using Hawaii's homeless shelters. The number soared by nearly three times between 2001 and 2006, and Micronesians now make up more than 20 percent of the state's total homeless population. Many of these homeless Micronesians are families from the FSM who cannot afford the high cost of housing in Hawaii.

Year	Number of Micronesians in homeless shelters in Hawaii
2001	286
2002	316
2003	554
2004	463
2005	513
2006	736

Use the number of Micronesians in homeless shelters in Hawaii for the following calculations. Do not use the year data!

1. ___________ Find the minimum for the number of Micronesians in homeless shelters in Hawaii.
2. ___________ Find the maximum for the number of Micronesians in homeless shelters in Hawaii.
3. ___________ Find the range for the number of Micronesians in homeless shelters in Hawaii.
4. ___________ Find the mode for the number of Micronesians in homeless shelters in Hawaii.
5. ___________ Find the median for the number of Micronesians in homeless shelters in Hawaii.
6. ___________ Find the mean (average) for the number of Micronesians in homeless shelters in Hawaii.
7. ___________Overall is the number of Micronesians in homeless shelters in Hawaii increasing, decreasing, or staying about the same over the time period shown above?

Part II: Number Bases

Matching. Match the color to the correct hexadecimal RGB color command. Write the letter of for the correct hexadecimal RGB color command next to the color.

Color	Hexadecimal RGB color command
8. _____ Black	A. #000
9. _____ Blue	B. #00F
10. _____ Green	C. #0F0
11. _____ Red	D. #F00
12. _____ White	E. #FFF

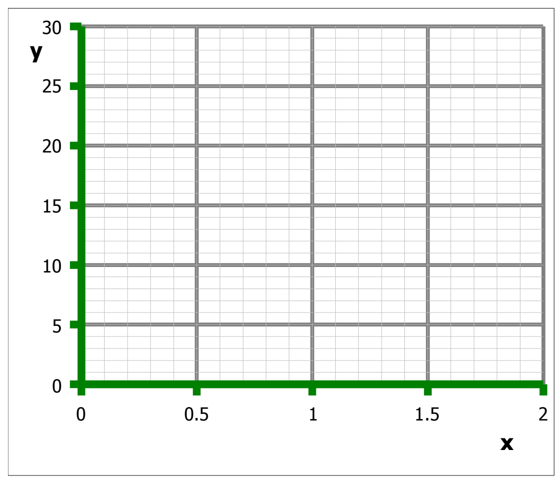
13. __________ What is 4 + 4 in base 5 (pental)?

14. __________ What is 6 + 6 in base 16 (hexadecimal)?

15. __________ What is B + B in base 16 (hexadecimal)?

Part III: Linear equations and linear regressions

Young boys in Dolokei, Nett recorded the following data for a *peisihr* throwing stick thrown along the road. A *peisihr* stick sliding on a road is like walking at a steady pace on a road.



time/sec (x)	distance/meters (y)
0	0
0.6	10
1.2	20
1.8	30

16. Plot the data above on the graph:

Formulas

Slope	Point-slope	Slope-intercept
$slope\ m = \frac{rise}{run} = \frac{(y_2 - y_1)}{(x_2 - x_1)}$	$(y - y_1) = m(x - x_1)$	$y = mx + b$

17. slope m = __________ Determine the slope of the best fit line.

18. y-intercept = ________ Determine the y-intercept of the best fit line.

19. ____________________ Write out the slope-intercept equation for the line.

20. ________ If the *peisihr* stick travels for 2.4 seconds, how far will it go?

21. ________ How long does it take the peisihr stick to travel 55 meters?

Part IV: Quadratic equations:

A Continental Micronesia 737-700 rolling down a runway at takeoff accelerates like a ball rolling down a slope. The following time and distance data was recorded for a Continental Micronesia plane taking off from *Daketik*:

time/sec (x)	distance/meters down the runway (y)
0	0.0
5	100
10	400
15	900

22. Fill in the following table by squaring the times in the table above:

$time^2/sec^2$ (x)	distance/meters (y)
	0
	100
	400
	900

OpenOffice.org Calc Formulas

slope	=slope(y-values;x-values)
y-intercept	=intercept(y-values;x-values)

23. slope m = ___________ Determine the slope of the $time^2/sec^2$ versus distance/meters line. You can use the OpenOffice.org to assist you.

24. y-intercept = ________ Determine the y-intercept of the $time^2/sec^2$ versus distance/meters line.

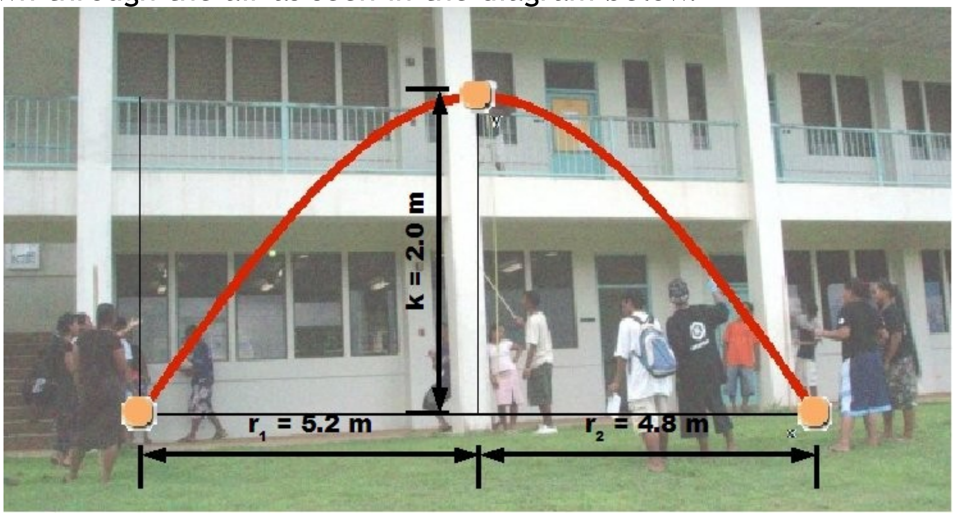
25. y = ________ x^2 + __________ Write out the quadratic equation.

26. __________________ How far will the aircraft have traveled in 20 seconds?

Photograph by D. C. Meyer, taken on 10 May 2007, Pohnpei FSM.

Part V: Ball Arc

A ball is thrown through the air as seen in the diagram below.



Note that in the diagrame r_1 = 5.2 meters, r_2 = 4.8 meters, and k = 2.0 meters.

The equation of the arc of the ball in the air is give by: $y=-\left(\frac{k}{r^2}\right)x^2+k$

27. k = ________ Use the diagram to determine the y-intercept k.

28. r = ________ Use the diagram to find the average distance of the roots r by calculating $r=\frac{(r_1+r_2)}{2}$

29. Write out the equation of the arc of the ball: y = ____________ x^2 + _____________

Part VI

30. _______ How many balls are used in the site swap pattern 423?

31. _______ How many balls are used in the site swap pattern 51?