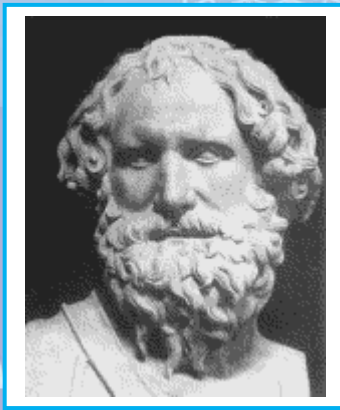


*Pythagoras*



*Archimedes*



*Euclid*

A  
MATHEMATICS  
Winter  
Number Land

**ANSWER KEY/SOLUTIONS**

Grade 9

Winter 2011-2012



Miami-Dade County Public Schools  
Curriculum & Instruction

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## WELCOME TO A MATHEMATICS WINTER NUMBER LAND

The realm of mathematics contains some of the greatest ideas of humankind. The *A Mathematics Winter Number Land* activities included in this packet are a mathematical excursion designed to be read, fun to do, and fun to think and talk about. These activities will assist you in applying the concepts you have studied. Additionally, each activity addresses a specific Sunshine State Benchmark. Each benchmark is listed at the end of the activity.

The journey to true mathematics understanding can be difficult and challenging but be patient and stay the course. Mathematics involves profound ideas. As we make these ideas our own, they will empower us with strength, techniques, and the confidence to accomplish wonderful things. Enjoy working each activity.

Included as part of this packet, is a link to the Miami-Dade County Public Schools Student Portal *Links to Learning* technology activities. Individualized student learning paths have been designed based on FCAT/EOC scores and are aligned to the District's Pacing Guides. These online activities are supplemental and, as such, are not to be assigned or graded. All online activities are provided as a resource to both parents and students to engage learning using technology. Please log on just as you do at your school.

If you are in need of additional information about the *A Mathematics Winter Number Land* Winter Break Activity Packet, please contact the Division of Mathematics, Science, and Advanced Academic Programs, at 305 995-1939.

### Tips for A Mathematics Winter Number Land

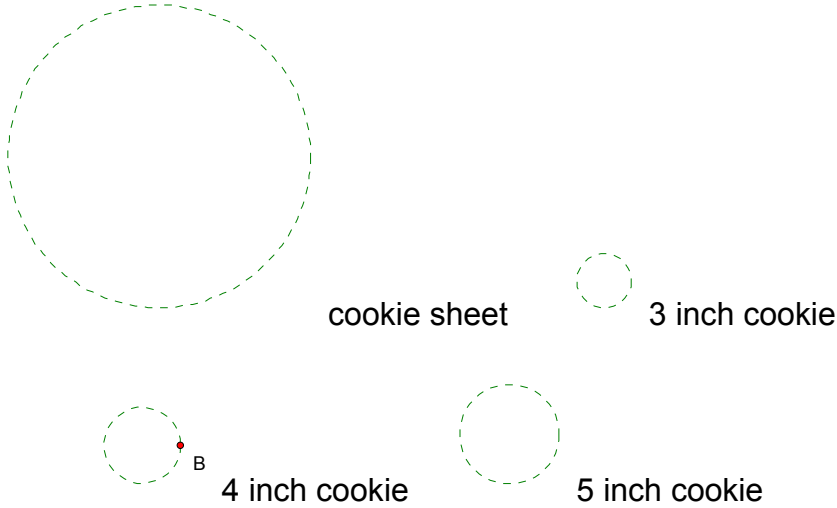
Read the activity and attempt to answer the questions that follow. The only rules are:

1. Make an earnest attempt to solve the problem. Record your attempts.
2. Be creative.
3. Don't give up. If you get stuck, look at the story and question a different way.
4. Discuss your story with your family.
5. HAVE FUN!

# SOLUTIONS

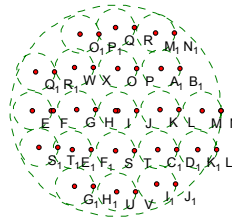
## A COOKIE DILEMMA

- Select an appropriate scale and draw a diagram to scale of your cookie sheet, the 3-inch cookie, the 4-inch cookie, and the 5-inch cookie.

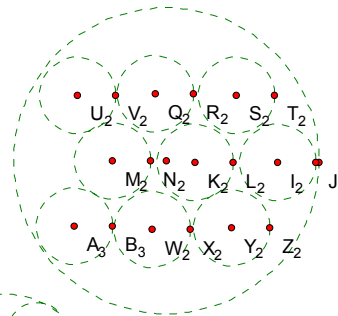


Scale 3.1:1

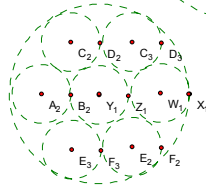
- 3-Inch Cookie Diagram  
Estimated # of Cookies 26



- 4-Inch Cookie Diagram  
Estimated # of Cookies 9



- 5-Inch Cookie Diagram  
Estimated # of Cookies 7



3. Empty space on
  - a. 3 inch cookie sheet: 26.69 square inches free
  - b. 4 inch cookie: 15.01 square inches free
  - c. 5 inch cookie: 9.61 square inches free

4. Answers will vary.

# SOLUTIONS

## PLANNING A VACATION

All answers will vary according to the choices the student makes. Below is a sample solution

**PART I:** Let's plan our trip!

TRIP PLANNER	
<b>Travel Allowance :</b>	<i>\$2000.00</i>
<b>Destination:</b>	<i>Orlando</i>
<b>Number of nights away from home:</b>	<i>3</i>
<b>Number of days traveling:</b>	<i>4</i>
<b>Dates of the trip</b>	<i>December 26 – December 29</i>
<b>Number of family members:</b>	<i>4</i>

- I.
- |                                      |                           |
|--------------------------------------|---------------------------|
| a. Hotel                             | <u><i>Hampton Inn</i></u> |
| b. Cost per night including room tax | <u><i>\$129.00</i></u>    |
| c. Number of family members          | <u><i>4</i></u>           |
| d. Number of nights in hotel         | <u><i>3</i></u>           |
| e. Miscellaneous hotel expenses      | <u><i>0</i></u>           |

II. Locate the attraction(s) you will visit during your stay.

	Attraction	Entry Cost	Other Fees
1.	<i>Magic Kingdom</i>	<i>80.00/person</i>	<i>25 food/person</i>
2.	<i>Universal</i>	<i>89.99/person</i>	<i>25 food/person</i>
3.	<i>Sea World</i>	<i>70.00/person</i>	<i>25 food/person</i>
4.			

- III. Plan your meals.
- |   |                        |
|---|------------------------|
| a. Number meals per day per person            | <u><i>3</i></u>        |
| b. Cost of meals for one person per day       | <u><i>\$40.00</i></u>  |
| c. Number of family members                   | <u><i>4</i></u>        |
| d. Total cost of meals for all family members | <u><i>\$160.00</i></u> |

IV. Estimate the cost of the gasoline for the car and determine your driving directions.

- |   |                             |
|---|-----------------------------|
| a. Number of miles between your home and your destination | <u><i>350 miles</i></u>     |
| b. Cost of a gallon of gasoline                           | <u><i>\$2.75/gallon</i></u> |
| c. Car's average miles per gallon                         | <u><i>18 mpg</i></u>        |
| d. Total number of gallons needed for the trip            | <u><i>20</i></u>            |
| e. Total cost of the gasoline                             | <u><i>\$53.48</i></u>       |

V. Estimate your souvenir costs.



	Souvenir	Cost
1.	Mickey Mouse Stuffed animal	\$20.00
2.	_____	_____
3.	_____	_____
4.	_____	_____

VI. Calculate your total trip expenses. Be sure you have included expenses for every member of your family.

TOTAL TRIP EXPENSES		
OUR DESTINATION		
		Cost
Hotels:		\$387.00
Meals:		\$160.00
Gasoline:		\$53.48
Admission Fees:		\$960.00
Souvenirs		\$20.00
Food:		
Miscellaneous Fees:		
	<b>Total:</b>	<b>\$1580.48</b>

**PART II Budget Analysis**

1. Based on your estimated expenses, what percent of your budget was spent on the following:
  - a. Gasoline 2%
  - b. Lodging 19.35%
  - c. Food 8%
  - d. Entertainment 48%
  - e. Miscellaneous 0%
  - f. 22.65% unused \_\_\_\_\_



## SOLUTIONS

### VACATION BASKETBALL

1.

PLAYER	POS	HT	INCHES	WT
<u>Joel Anthony</u>	C	6'9"	81	245
<u>Earl Barron</u>	C	7'0"	84	245
<u>Mark Blount</u>	C-F	7'0"	84	250
<u>Daequan Cook</u>	G	6'5"	77	205
<u>Ricky Davis</u>	G	6'7"	79	205
<u>Anfernee Hardaway</u>	G-F	6'7"	79	215
<u>Udonis Haslem</u>	F	6'8"	80	235
<u>Alexander Johnson</u>	F	6'9"	81	230
<u>Alonzo Mourning</u>	C	6'10"	82	261
<u>Shaquille O'Neal</u>	C	7'1"	85	325
<u>Smush Parker</u>	G	6'4"	76	190
<u>Chris Quinn</u>	G	6'2"	74	175
<u>Dwyane Wade</u>	G	6'4"	76	216
<u>Jason Williams</u>	G	6'1"	72	180

1.

- a. Independent Variable Weight
- b. Dependent Variable Height

2. The data set represents a relation not a function
3. See graphs
4. There a positive correlation between the data
5. The relation is increasing.
6. Determine the equation of the line of best fit. *Answers will vary*

- a. Select two points (180,73) and (245, 81)
- b. Determine the slope of the line between these two points

Slope 0.123

What is the real-world meaning of the slope? The height increases by 0.123 inches for each pound gained.

- c. Write the equation of the line in slope/intercept form.

Equation of Line-of-Best Fit height = 0.123 weight + 50.85

d. Explain what the  $y$ -intercept in the equation represents

The person adds 50 pounds for each inch in height.

7. For each inch the height increases, the weight changes by 50 pounds

8. It changes by 50 pounds.

9. A player on this team who is 6 feet 6 inches tall weighs approximately 220.73 pounds.

10. Use your graphing calculator to enter the data into the list functions, graph the scatter plot, and determine the linear regression equation.

a. Slope 0.086

b.  $Y$ -intercept 59.587

c. Value of  $r$  0.885. The line is an O.K. estimate of the data.

11. Answers will vary.

12. 90 inches tall. Yes, this basketball player would be 7 feet 6 inches tall but the average person is not that tall.

## SOLUTIONS BLACK FRIDAY

### PART I: .

25% of what is 28?	<u>7</u>	What percent of 72 is 18?	<u>25</u>	60% of what is 45?	<u>75</u>
What percent of 12 is 6?	<u>50</u>	What is 60% of 12?	<u>7.2</u>	75% of what is 48?	<u>64</u>
What is 20% of 650?	<u>130</u>	What percent of 150 is 90?	<u>60</u>	What percent of 90 is 63?	<u>70</u>
What is 38% of 60?	<u>22.8</u>	22.5% of what is 42?	<u>186.6</u>	45% of what is 99?	<u>220</u>
What percent of 210 is 10.5?	<u>5</u>	160% of what is 124?	<u>77.5</u>	What is 39% of 1500?	<u>585</u>
What is 250% of 14?	<u>35</u>	What percent of 20 is 36?	<u>180</u>	What is 8.25% of 160?	<u>13.2</u>

Write an equation to model each question and solve.

1.  $x/100=16/25$ , 64%
2.  $16x=4800$ , 300
3.  $x/100 = 204/3600$ , 6%
4.  $30x=81000$ , 2700
5.  $100x = 167500$ , 1675

**PART II:** The formula for determining simple interest is  $I = prt$ . Using this formula, solve the following problems. ( $p$  – principal,  $r$  – rate,  $t$  – time)

1. \$371.25
2. 6.5%
3. \$1250

What is 7% of 480?	33.6	What percent of 80 is 48?	60%
What is 150% of 26?	39	125% of what is 175?	140
What is 35% of 360?	126	What percent of 36 is 9?	25
45% of what is 36?	80	What is 80 % of 120?	96
25% of what is 92?	368	What percent of 30 is 90?	300%
90% of what is 27?	30	75% of what is 90?	120
What is 10.25% of 280?	28.7	What percent of 20 is 8?	40%
What is 39% of 800?	312		

# SOLUTIONS

## THE PRICE OF GASOLINE

**PART I:** Determine each of the following solutions. Use a separate sheet of paper to show how you arrived at each solution.

1. Suppose a van gets 22 mi/gal. The distance traveled  $D(g)$  is a function of the gallons of gas used.
  - a. Use the rule  $D(g) = 22g$  to make a table of values and then graph it. Label your graph.

**Table of Values**

Gallons	Distance
0	0
1	22
2	44
3	66
4	88
5	110

- |   |
|---|
| <ol style="list-style-type: none"><li>b. 231 miles</li><li>c. No, the data is discrete data</li></ol> |
|---|

2.

Label	Time in hours	Distance in miles,
Unit	$h$	$D$
	1	10
	2	20
	3	30
	4	40

- d. Distance increases by 10 miles for every hour traveled
- e. Distance increases each hour

3.

**Table of Values**

Label	# of Passengers	Cost
Unit	People	Dollars
	1	3.50
	2	4
	3	4.50
	4	5
	5	5.50

f. The admission for a car with 6 people in it is \$6.00.

g. No, the data is discrete.

4. For a car traveling at a constant rate of 60 mi/h, the distance traveled is a function of the time traveled. Label your graph.

Label	Time in hours	Distance in miles
Unit	<i>h</i>	<i>D</i>
	1	60
	5	300
	10	600
	15	900
	20	1200

- h. Distance = 60\*hours  
i. Domain: Time in Hours; Range: Distance in miles

# SOLUTIONS

## FORENSIC MATHEMATICS

1. The area of the puddle increases as a constant rate
- 2.

<b>Puddle Number</b>	1	2	3	4
<b>Radius</b>	5 cm	10 cm	15 cm	20 cm
<b>Area</b>	$25\pi$	$100\pi$	$225\pi$	$400\pi$

3. The puddle increases a rate of the square of the radius of the puddle.  $A=(n+r)^2\pi$
4.  $(n + r)^2 = n^2 + 2nr + r^2$
5. Area 1 =  $900\pi$  cm<sup>2</sup>, Area 2 =  $1024\pi$  cm<sup>2</sup>  
124 cm/min



## ANTI-DISCRIMINATION POLICY

### Federal and State Laws

The School Board of Miami-Dade County, Florida adheres to a policy of nondiscrimination in employment and educational programs/activities and strives affirmatively to provide equal opportunity for all as required by law:

**Title VI of the Civil Rights Act of 1964** - prohibits discrimination on the basis of race, color, religion, or national origin.

**Title VII of the Civil Rights Act of 1964**, as amended - prohibits discrimination in employment on the basis of race, color, religion, gender, or national origin.

**Title IX of the Educational Amendments of 1972** - prohibits discrimination on the basis of gender.

**Age Discrimination in Employment Act of 1967 (ADEA)**, as amended - prohibits discrimination on the basis of age with respect to individuals who are at least 40.

**The Equal Pay Act of 1963**, as amended - prohibits gender discrimination in payment of wages to women and men performing substantially equal work in the same establishment.

**Section 504 of the Rehabilitation Act of 1973** - prohibits discrimination against the disabled.

**Americans with Disabilities Act of 1990 (ADA)** - prohibits discrimination against individuals with disabilities in employment, public service, public accommodations and telecommunications.

**The Family and Medical Leave Act of 1993 (FMLA)** - requires covered employers to provide up to 12 weeks of unpaid, job-protected leave to “eligible” employees for certain family and medical reasons.

**The Pregnancy Discrimination Act of 1978** - prohibits discrimination in employment on the basis of pregnancy, childbirth, or related medical conditions.

**Florida Educational Equity Act (FEEA)** - prohibits discrimination on the basis of race, gender, national origin, marital status, or handicap against a student or employee.

**Florida Civil Rights Act of 1992** - secures for all individuals within the state freedom from discrimination because of race, color, religion, sex, national origin, age, handicap, or marital status.

Veterans are provided re-employment rights in accordance with P.L. 93-508 (Federal Law) and Section 295.07 (Florida Statutes), which stipulates categorical preferences for employment.

Revised 9/2008