8th Grade Assignment – Week #30

Individual Work

- The **Algebra Test** is at the end of this document. Please take it by the end of this week.

Group Assignments:

For Tuesday (I will give answers to the below problems during Wednesday's lecture.)

1) *Number Magic.* During Monday's lecture, I asked you to choose two 2-digit numbers, and multiply them together to get a first answer. Then you were to reverse the digits of the original 2-digit numbers, and then multiply these together to get a second answer. Lastly, you were to find the difference (subtract) of these two answers to get a final result. The results given in the lecture were: 1287, 2079, 4950, 2376, 6336, 2970. You should also add a few of your own results.
   Questions:
   - What do you notice about all the final numbers?
   - What is the Greatest Common Factor of all the numbers?

2) *Catching Up.*
   Jeff leaves home jogging at a rate of 5 km/h. One hour later, his mother drives after him at a rate of 60 km/h. After how much time (exactly!) will she catch up to him?

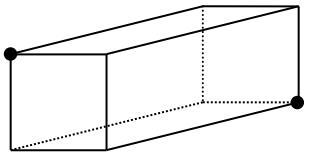
3) *Card Trick.* Come up with an explanation for why the "magic card" is always in the 7th position.

For Thursday

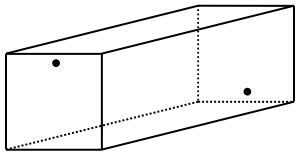
1) *Factors – Part II.* Fill out the below table and see if you can discover the shortcut for determining how many factors a given number has.

Number	Prime Factorization	Number of Factors
343	7^3	4
25	5^2	
		7
		13
36	$2^2 \cdot 3^2$	
100	$2^2 \cdot 5^2$	
48	$2^4 \cdot 3$	
42	$2 \cdot 3 \cdot 7$	
72	$2^3 \cdot 3^2$	
3,969	$3^4 \cdot 7^2$	
65,000	$2^3 \cdot 5^4 \cdot 13$	

2) a) Two ants are at diametrically opposite corners on the outside surface of a box that measures 24x24x60 cm. What is the length of the shortest path, from one ant to the other? (The ants must walk along the outside of the box.)



b) Same box, but this time one ant is on the front square wall of the box, equally far from each of the rectangular side walls and 2 cm from the ceiling. The other ant is diametrically opposite – i.e., on the back wall, 2 cm up from the floor, and equally far from the side walls. What is the length of the shortest path, from one ant to the other?



Algebra Test

Simplify. (2 points each)

1) $-7 - 5$

2) $(-6)(-2)$

3) $12 - 3 \cdot 5$

4) $-5 + -3 - -2 - +7$

5) $5x^4 + 2x^4$

6) $6x^3 + 3x^4$

7) $(y^3)^4$

8) $x^4 \cdot x^2$

9) $4X + 3 + 5X - 8$

Evaluate the expression given
$X = 3; Y = 5; Z = -4$

10) $Y^2 - 3Z + 4X$

Solve each equation by getting X alone. *Except for #13, you must show what is done to each side*. (2 points each)

11) $8 + X = 3$

12) $-5x = 20$

13) $\frac{3}{7} = \frac{5}{x}$

14) $\frac{2}{3} X = 8$

Solve each equation by getting X alone. *You must show what is done to each side*. (4 points each)

15) $4X - 3 = 7X - 18$

16) $10 - 2(X - 3) = 6X - 5 - X$

17) $2X + 5 = -15$

18) $4 - 2X + 9X = 27 - 3X - 3$