

Mathemagics

➤ Arithmetic Course

$$(((ABCABC + 7) + 11) + 13) = ABC$$

- Start with a three digit number of the form ABC, where all three digits have different values, (i.e. 694).
- Tack on another ABC in front of the first ABC, to create a number of the form ABCABC (in the case above, it would become 694694, & ... talk about place value, and separation of "periods" in a number)
- Divide your ABCABC by 7
(talk about how probable it is that we all have a whole number quotient, and probability and divisibility)
- Divide your last result (your ABCABC + 7) by (oh thank heaven for seven) 11
(talk about how probable it is that we all still have a whole number quotient, and divisibility, specifically what we have all just divided by, overall [77 = 7 * 11])
- Divide your last result (your (ABCABC + 7) + 11) by ("unlucky") 13
- Anything interesting?
- Why does it work? (b/c $1001 = 7 * 11 * 13$ & $ABCABC + 1001 = ABC$)
- Show $ABC * 1001$ in standard columnar algorithmic form to explain

➤ Algebra Course

Birthday problem :

- Start by defining a Month Number & a Day Number
- Start with your Month Number
- Multiply by 5
- Add 7 (to the last result)
- Multiply by 4 (to the last result)
- Add 13 (to the last result)
- (Using Symmetry) Multiply by 5 (to the last result)
- Add your Day Number (to the last result)
- Tell me your number (your last result)

➤ Algebra Course

1089 :

- *Start with a 3 digit number, of the form ABC, where all three digits have different values, (i.e. 587).*
- *Rearrange it to make the greatest number possible, (in the form XYZ , where $X > Y > Z$... in the case of the example above 587 becomes 875)*
- *Rearrange it to make the least number possible, (in the form ZYX , where $Z < Y < X$... in the case of the example above 587 becomes 587)*
- *Subtract your lesser number from your greater number to reveal your magic difference, now of the form DEF*
- *Transpose your magic difference DEF to create a transposed magic difference, now of the form FED*
- *Create your very own magic sum, by adding your magic difference, DEF , to your transposed magic difference, FED*
- *Turn to your neighbor and compare your magic sum*

➤ Any course

The Black Hole of 6174 & Beyond ... :

- *Start with a 4 digit number, of the form ABCD, preferably where all four digits have different values, (i.e. 6381), but where at least two digits are dissimilar.*
- *Rearrange your four digit number ABCD to make the greatest number possible, (in the form WXYZ , where $W > X > Y > Z$... in the case of the example above 6381 becomes 8631)*
- *Rearrange your four digit number ABCD to make the least number possible, (in the form ZYXW , where $Z < Y < X < W$... in the case of the example above 6381 becomes 1368 (the transposed form of the result above)*
- *Subtract your lesser number, ZYXW, from your greater number, WXYZ, to reveal your first difference, now of the form JKLM*
- *Now using your most recent difference, JKLM, rearrange your four digit difference JKLM to make the greatest number possible, (again in the form PQRS , where $P > Q > R > S$) and rearrange your four digit difference JKLM to make the least number possible, (in the form SRQP , where $S < R < Q < P$)*
- *Subtract your new lesser number, of the form SRQP, from your new greater number, PQRS, to reveal your second difference, now of the form, EFGH*
- *Repeat the process above, making the greatest and least four digit numbers from your most recent result, and subtract them to continue producing new differences, which you keep on rearranging and subtracting until something interesting occurs*

The Black Hole of 6174 & Beyond... (Continued) :

- ***There are many Black Holes when you get up to five, six, seven, etc. digit seed values , but they all have one thing in common***
- ***What is that?***

➤ Algebra or Any Course

Card Tricks :

- ***“King Up” (why 10 ?)*** [Use in an algebra or above course]
- ***“Ten Up” (why 19 ?)*** [Use in an algebra or above course]
- ***“Ace, Two, Two, Three, ... ”*** [Use in an any course]
(What is the order ? ... why is it 3, 8, 7, A, Q, 6, 4, 2, J, K, 10, 9, 5 ?)
- ***3 X 7 & 3 X 9 Stacking-Sandwich Card Trick***

Technology with Basic Skills Students

- Embarrassed about mathematical deficiencies so these can be done “solo”...
- PowerPoint Digital Flashcards
available @ : www.matheverest.com
(Mention to use Mozilla Firefox & can download free PowerPoint Viewer too...)
- Arcademics Drill & Practice Games
(available @ : <http://www.matheverest.com/arcademics.html>)