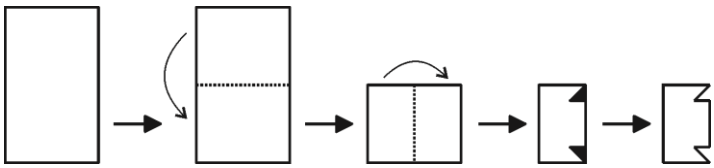
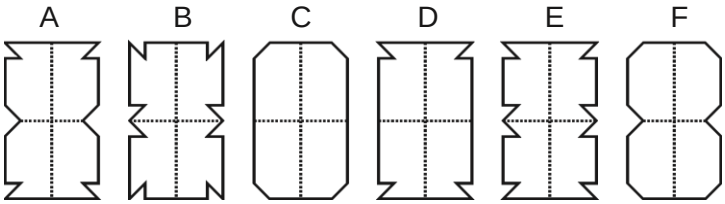
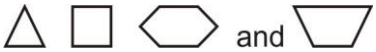
Logic Challenges Student Sheet

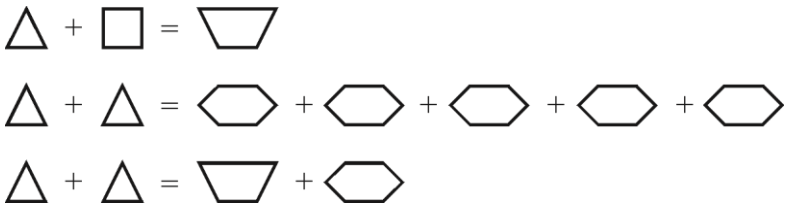
1. _____ A rectangular sheet of paper is folded twice and then cut, as shown below. All fold lines are dashed, and the portion that is to be cut away is shaded.



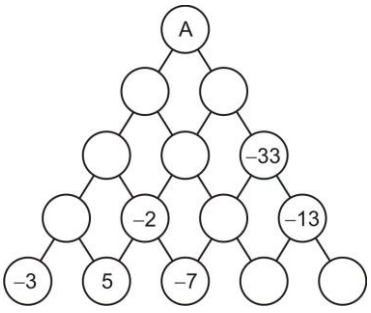
Which of the following drawings (A, B, C, D, E or F) shows what the paper looks like when it is unfolded after the cuts?



2. _____ The symbols  represent four different integers from 1 to 9. Using the equations below, what is the value of  ?



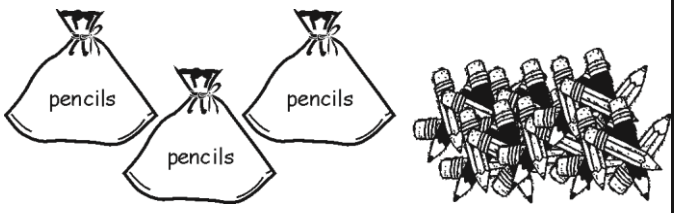
3. _____ Some numbers of this tree are given, and only the top five rows of the tree are shown. If each number in a circle is the sum of the two numbers it is attached to in the row below it, what number will appear in circle A?



4. _____ Five friends are standing in a line. Cliff is standing directly behind Danny, and there are two people between Cliff and Mark. Mark is standing somewhere behind Eric, but somewhere in front of Tom. Which of the five friends is fourth in line?

5. _____ Today Darron's teacher pairs each student with a partner to create exactly students 12 pairs of students. Next week each student will be paired with a different partner. Darron's partner for next week only can be chosen from how many students?

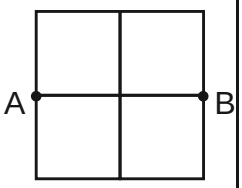
6. _____ Zach has three bags and a pencils bunch of pencils to be placed into the bags. He is told to place the greatest number of pencils possible into each of the three bags while also keeping the number of pencils in each bag the same. What is the greatest number of pencils he could have left over?



7. _____ The letters P, Q, R, S and T have replaced digits in the equation to the right. Given that each digit 1 through 9 is used exactly once in the equation, which digit must Q represent?

$$\begin{array}{r} P\,4\,Q \\ +\;2\;R\;5 \\ \hline S\,1\,T \end{array}$$

8. _____ Raquel colors in this figure so that each of the four unit squares ways is completely red or completely green. In how many different ways can the picture be colored this way so that there is a horizontal line of symmetry at segment AB?



eight to

9. _____ March 30, 2003, can be expressed numerically with total digits as 03/30/2003. However, only three distinct digits are used express the date in that manner. What was the next date after 03/30/2003 that used exactly three distinct digits when expressed numerically in this way? Write the date in this same manner.

10. _____ In the land of Noggin Knockers, the inhabitants greet each other people by bumping heads. At a certain gathering a total of 36 bumps were exchanged. If each person there bumped heads exactly once with each other person, how many people were at the gathering?

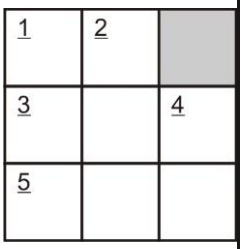
11. _____ If I have two more brothers than sisters and each of my brothers also has two bros more brothers than sisters, how many more brothers than sisters does my oldest sister have?

12. _____ The heights of six students Joe, Mary, Sue, Steve, Lisa and John are inches
60 inches, 64 inches, 58 inches, 68 inches, 63 inches and 69 inches. Sue is 4 inches shorter than Joe. The girls are the three shortest students. Steve is 1 inch shorter than John. Mary is the shortest student. What is the sum of John's height and Lisa's height?

****Challenging****

13. _____ There are 64 identical-looking coins, one of which is slightly uses
heavier than the others. A balance scale can be used to show which one of two groups of coins is heavier or that the two groups weigh the same. What is the minimum number of uses of the balance scale that is guaranteed to determine which of the coins is the heavier one?

14. _____ In the number puzzle to the right (that works like a crossword puzzle), each of the eight non-shaded unit squares contains one digit. What is the answer to 1-Across?



Across	Down
1. A prime number	1. A multiple of 9
3. A perfect square	2. A perfect cube
5. A perfect fourth power	4. A perfect square