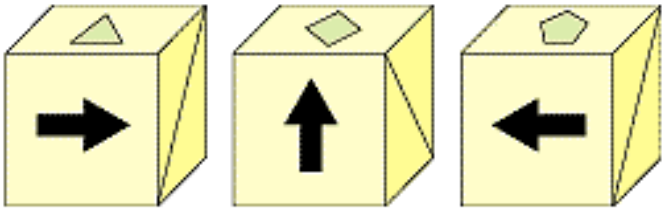
2009 Primary Math World Contest Tryouts Problems

20 problems done in 45 mins. No calculator is allowed. Only correct answer counts. Max pts is 50. [Problem 1-5: 1pt each] [Problem 6-10: 2 pts each] [Problem 11-15: 3 pts each] [Problem 16-20: 4 pts each] Please put answers in the answer sheet provided and be sure to turn in the answer sheet.

[Problem 1-5: 1point each]

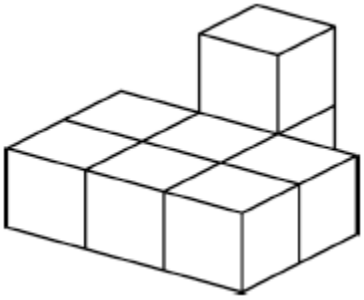
1) Evaluate: 2009 x 2009. (i.e., 2009 x 2009 = ?)

2) Draw the next figure in the pattern. [*A blank box is provided in the answer sheet*.]

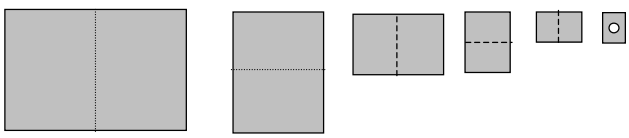


3) Jessica was born on January 1st, 2009, and is 365 days younger than Grace. What was Grace's birth date?

4) Eight (8) blocks have been glued together to make the shape below. How many faces of these blocks have glue on them?



5) Karol folds a sheet of paper in a half and then repeats this four more times. Then he makes a hole in the folded paper. How many holes does the sheet of paper have after unfolding?

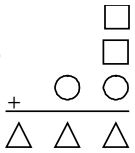


2009 Primary Math World Contest Tryouts Problems

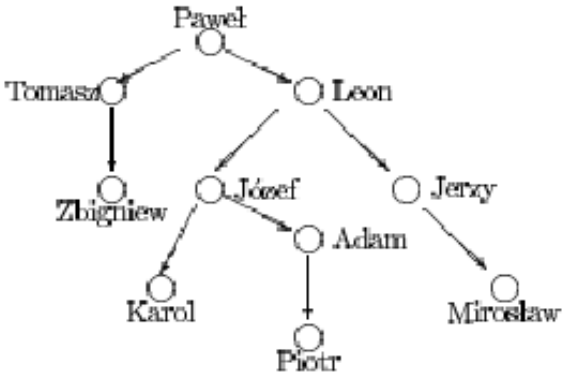
[Problem 6-10: 2 pts each]

6) The weight of 3 apples and 2 oranges is 255 g. The weight of 2 apples and 3 oranges is 285 g. Each apple weighs the same and each orange weighs the same. How many grams are the combined weight of 1 apple and 1 orange?

7) From the addition problem, what value would the square shape (□) represent? Note that each shape represents a digit from "0-9" and different shapes represent different digits. Also, a valid number doesn't start / lead with "0".



8) Piotr created a genealogical tree of the men in his family. The arrows go from a father to a son. What was the name of the son of the brother of the grandfather of Piotr's father's brother?



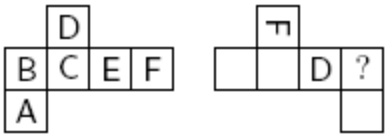
9) The Paradise Island of the Pacific has an unusual weather pattern: Tuesdays and Thursdays are rainy, Sundays are foggy and the other days are sunny. A group of tourists would like to go on a 51-day long vacation to the island. What would be the maximum number of sunny days they could have?

10) Andy, Billy, Clarence, and David said the following about a certain number: Andy: "This number is 91"; Billy: "This number is prime."; Clarence: "This number is even."; David: "This number is 87." Only one statement given either by Billy or Andy is true, as well as only one statement given by either Clarence or David is true. What is the number?

2009 Primary Math World Contest Tryouts Problems

[Problem 11-15: 3 pts each]

11) Two students having an identical paper cube with its 6 faces labeled A, B, C, D, E, F in the same way, cut open their cube to form the following diagrams. One student erased some letters except two faces marked "F" and "D" from his cube. What was the letter on the face marked "?" originally?

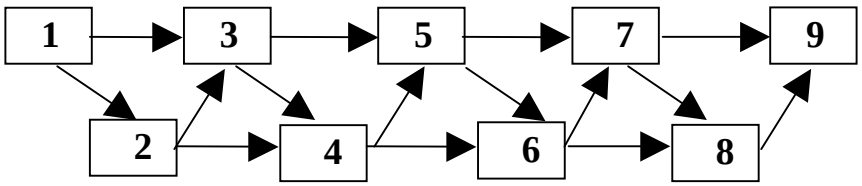


12) When Elaine is born, her parents buy candles shaped like the ten digits 0 to 9. They buy two of each kind of candle. On each of Elaine's birthdays they light the appropriate candles on her birthday cake. So, for example, on her first birthday they use just one "1" candle, while on her 10th birthday they use two candles, a "1" and a "0". Each candle can be used only 6 times altogether. Eventually there comes a birthday when both copies of one of the required candles are already used up. How old (in years) does Elaine become on that birthday?

13) Marvin has saved twice as many quarters as dimes. He puts them in two jars (Jar A and Jar B) so that the ratio of the number of quarters to dimes in Jar A is 2:7 and there are only quarters in Jar B. What would be the ratio of the number of quarters in Jar A to the number of quarters in Jar B?

14) Simplify $\dfrac{2009 + 20092009 + 200920092009}{2058 + 20582058 + 205820582058}$

15) Always following the direction of the arrows, what is the **number of distinct paths** from **1** to **9**?



2009 Primary Math World Contest Tryouts Problems

[Problem 16-20: 4 pts each]

16) For a house-painting job, if painter A and painter B work together, it would take them 6 days to finish. If they work alone, painter A would take 5 fewer days than painter B. How many days would painter B take if he works alone?

17) A teacher wrote whole numbers sequentially from 1 to 2009 (i.e., 1, 2, 3, …, 2008, 2009) on a whiteboard. Then she asked student A to underline all numbers divisible by 2, student B to underline all numbers divisible by 3, and student C to underline all numbers divisible by 4. When the students were done underlining, how many numbers were underlined exactly twice?

18) A staircase has 9 stairs. John can climb one or two stairs each time when he climbs the staircase. In how many ways can he complete the climbing of the staircase? For example, to reach stair (1), there is 1 way. To reach stair (2): there are 2 ways (2 one-stair or 1 two-stairs).

19) Evaluate the following complex /nested fraction. What would be the whole number part of the result?

$$\frac{1}{\frac{1}{2000}+\frac{1}{2001}+\frac{1}{2002}+\frac{1}{2003}+\frac{1}{2004}+\frac{1}{2005}+\frac{1}{2006}+\frac{1}{2007}+\frac{1}{2008}+\frac{1}{2009}}$$

20) Jonathan swims 2.5 times as fast as Ken. They start together at one end of the pool and swim back and forth from one end to the other. The swimming pool is 25m in length. Ken swims 30 laps of the pool (750 m) and then stops. How many times has Jonathan passed Ken, either going in the same direction or in the opposite direction? (If Jonathan and Ken arrive at one end of the pool at the same time, it counts as a pass. But do not count the beginning when they start together.)