0.1 Elementary Level Sample Problems

Problem 1 If a certain rectangle has an area of $24cm^2$ and its length is equal to 6 cm, what is the perimeter of the rectangle?
Answer: 20 cm

Problem 2 Ada has 7 shirts, 5 pants, and 3 sets of shoes. How many distinct outfits can she create?
Answer: 105 outfits

Problem 3 Isaac has a bag with 3 red marbles, 5 green marbles, and 7 blue marbles. What is the probability that if he randomly draws one marble without looking, it will turn out to be green?
Answer: $\frac{1}{3}$

Problem 4 $\frac{3*3*3}{3+3+3} =$?
Answer: 3

Problem 5 Albert, Blaise, Carl, and David had 2 apples each. Each person ate one apple. How many apples do they now have altogether?
Answer: 4 apples

Problem 6 When Alan was born, Bertrand was 4 years old. Now Alan is 3 years old. How old is Bertrand?
Answer: 7 years old

Problem 7 How many even numbers are there between 21 and 31?
Answer: 5 even numbers

Problem 8 $3.57 + 2.43 =$?
Answer: 6

Problem 9 What is the positive difference between $3*(3+3)$ and $(3*3)+3$?
Answer: 6

Problem 10 Albert built fewer sandcastles than Blaise but more than Carl. David built more sandcastles than Albert and more than Blaise. Edward built more castles than Blaise but fewer than David. Who built the most sandcastles?
Answer: David

0.2   Middle School Level Sample Problems

Problem 1   What is the positive solution of the equation $x = \frac{1}{2+\frac{1}{x-2}}$?
Answer: 1

Problem 2   Equilateral triangle ABC has a perimeter of 60 cm. Point Q is placed in or on the triangle, and the lengths AQ, BQ, and CQ are added together. What is the minimum value of the sum of the three lengths? Express your answer in simplest radical form.
Answer: $20\sqrt{3}$

Problem 3   Four-digit integers are formed using the digits 2, 3, 4, and 5. Any of the digits can be used any number of times. How many such four-digit integers are palindromes? (Palindromes read the same forward and backward)
Answer: 16

Problem 4   Leonhard, Pierre, and Rene play a game. Their probabilities of winning are $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{6}$, respectively. What is the probability that each of them wins exactly one of the first three games played? Express your answer as a common fraction.
Answer: $\frac{1}{6}$

Problem 5   The diagonals of a rhombus measure 18 and 12 cm. What is the perimeter of the rhombus? Express your answer in simplest radical form.
Answer: $12\sqrt{13}$ cm

Problem 6   In ten years, Euclid will be twice as old as Felix is now. Ten years ago, Gottfried was twice as old as Felix was then. Today is their birthday, and the sum of their three ages is now 130. How old is Felix now?
Answer: 30 years old

Problem 7   There is an operation @ such that $a@b = a^b + b^a$. What is the value of 2@5?
Answer: 57

Problem 8   What is the sum of the last two digits of the sum $7^{34} + 7^{35}$?
Answer: 11

Problem 9   If a is 80% larger than b, c is 50% larger than b, and $b = 100$, then a is what percent larger than c?
Answer: 20%

Problem 10 Henri has $5Q + 1$ quarters, and Bernhard has $Q + 5$ quarters. If they were to each exchange their quarters for the same amounts of money in dimes, how many more dimes than Bernhard does Henri have? Express your answer in terms of Q.

Answer: $10Q - 10$ *dimes*