

Q1. Fill in the blanks or choose the correct option for the following questions.

- i. An angle that is greater than 180° but less than 360° is called a/an _____ angle.
- ii. What is the next number in the sequence of Triangular numbers: 1, 3, 6, 10, 15, ...?
a) 20 b) 21 c) 25 d) 28
- iii. The special 4-digit number 6174 is known as the _____.
- iv. The shortest path between two points, A and B, is called a _____.
a) Line b) Ray c) Line Segment d) Point
- v. The number sequence 1, 4, 9, 16, 25, ... is called the sequence of _____ numbers.
- vi. What is the measure of a straight angle in degrees?
a) 90° b) 180° c) 270° d) 360°
- vii. Numbers that read the same from left to right and right to left, like 848, are called _____.
- viii. According to the Collatz Conjecture, if a number is odd, the rule is to:
a) take half of it b) multiply it by 3 and add 1 c) multiply by 2 and add 1 d) subtract 1 and divide by 2
- ix. Two lines that meet each other at a 90° angle are called _____ lines.
- x. Adding up the first five odd numbers ($1+3+5+7+9$) gives the square number:
a) 16 b) 20 c) 25 d) 36

Q2. Answer the following questions in a word, a sentence, or with a simple calculation.

- i. What is the digit sum of the number 584?
- ii. In the 'Number Play' activity with children of different heights, if a child says the number '2', what does it mean?
- iii. Name the vertex and the two arms of the angle $\angle PQR$.
- iv. Write the next three numbers in the sequence of Powers of 2: 1, 2, 4, 8, 16, __, __, __.
- v. Define a 'Supercell' in a table of numbers.
- vi. What is the measure of a right angle in degrees?
- vii. Apply the 'reverse-and-add' step once to the number 48. What is the resulting number?
- viii. Explain briefly why the numbers 1, 4, 9, 16, ... are called square numbers.
- ix. What is the angle in degrees between the hands of a clock at 2 o'clock?
- x. If the starting number is 12 in the Collatz sequence, what will be the next three numbers?

In the 'Number Play' activity, there are 5 children of different heights. Is the sequence 0, 1, 2, 1, 0 possible for the numbers they say? Draw a simple arrangement of the children (using lines of different heights) to explain why or why not.

Q4. Using a protractor and a ruler, draw an angle of 110° . Label its vertex and arms. Classify the angle as acute, obtuse, or right.

Q5. The sum of the first few odd numbers results in a square number. Explain this pattern by drawing a picture that shows why

$$1+3+5+7=16.$$

Q6. The number 6174 is Kaprekar's constant. Show the steps to reach this constant starting with the 4-digit number 3286.

Q7. A palindrome is a number that reads the same forwards and backwards. Write down all possible 3-digit palindromic numbers that can be formed using only the digits

'2', '3', and '2'.

Q8. How many lines can you draw that pass through:

- a) one single point?
- b) two distinct points? Illustrate your answers with rough figures.

Q9. This question is about "Supercells".

a) Will the cell containing the largest number in a table always be a supercell? Explain your answer with an example in a 1x3 grid. (5 Marks)

b) Fill the table below with any 4-digit numbers of your choice to get the maximum number of supercells possible. Circle the supercells.