

Sequence of Cubes Exercise (Section 2.5)

NAMES:

Turn in one paper per group but be sure all members of the group have seen the final answers. Circle your name if the paper that gets turned in is your copy.

The following is an exploration based on selected questions from Set II of the exercise set.

1. Fill in the missing sums for the pattern on the right.

$$1 = 1$$

$$3 + 5 =$$

$$7 + 9 + 11 =$$

$$13 + 15 + 17 + 19 =$$

2. What sequence do the numbers on the left sides of the equations form?

3. What sequence do the numbers on the right sides of the equations form?

4. Write the next two lines of the pattern.

5. Are [the equations from question 4] also true?

6. Fill in the missing sums for the pattern on the right.

$$\begin{aligned} 1 &= 1 \\ 1 + 8 &= \\ 1 + 8 + 27 &= \\ 1 + 8 + 27 + 64 &= \end{aligned}$$

7. To what sequence do the numbers on the left sides of the equations belong?

8. To what sequence do the numbers on the right sides of the equations belong?

9. Rewrite the pattern in question 6, using exponents. For instance, write the third line as $1^3 + 2^3 + 3^3 = 6^2$.

10. What is a shortcut for finding the last number [or sum] on each line?

11. Write the next two lines of the pattern.

12. Are [the equations from question 11] also true?

13. Fill in the missing bases for the pattern on the right. [Recall the base is the big number in an exponential expression, such as the 2 in 2^3 .]

$$3^2 + 4^2 = (\quad)^2$$

$$3^3 + 4^3 + 5^3 = (\quad)^3$$

14. Write what you think is the next line of the pattern.

15. Is [the equation from question 14] also true? Show why or why not.