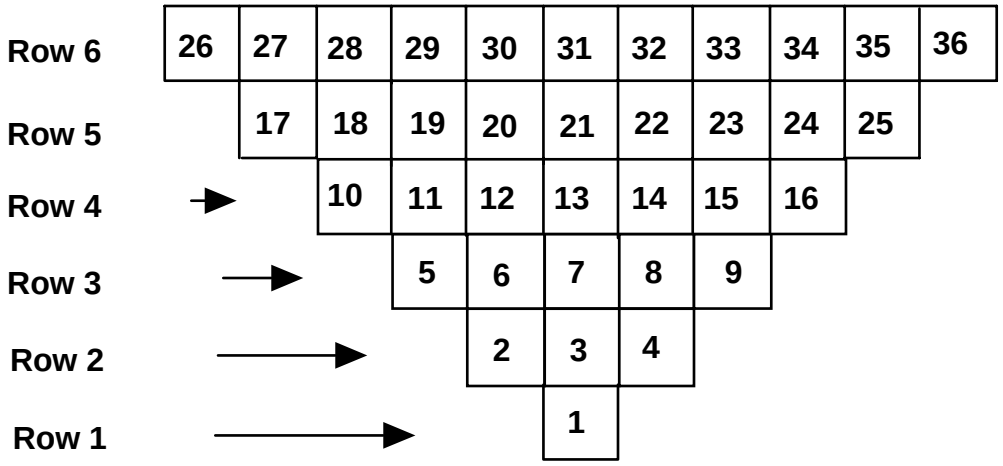
A Stadium Problem

The first six rows of a stadium section are shown below. The rows continue the same pattern, and there are 50 rows total.



1) For each of the following questions, try to find more than one approach for finding the answer, and think about how you could "convince a skeptic" that your answer is correct.

a. How many seats are there in row 7?
b. How many seats are there in row 8?
c. How many seats are there in row 20?
d. Which (if any) row contains exactly 21 seats?
e. Which (if any) row contains exactly 100 seats?
f. Which (if any) row contains exactly 157 seats?

2) Make up and solve some questions similar the ones above.

3) Look for patterns in the number of seats in each row. Find as many as you can. Can you "convince a skeptic" that your patterns will continue? Can you find an equation or other simple method for easily finding the number of seats in row r? Can you convince a skeptic that your equation or method always works?

4) For each of the following questions, try to find more than one approach for finding the answer, and think about how you could "convince a skeptic" that your answer is correct.

a. What is the number of the leftmost seat in row 8?
b. What is the number of the middle seat in row 8?
c. What is the number of the rightmost seat in row 8?
d. Where is seat 200 located?

5) Make up and solve some questions similar the ones above.

6) Look for patterns in the rightmost seat in each row. Find as many as you can. Can you "convince a skeptic" that your patterns will continue?

7) How many seats are there altogether in the stadium section?

8) Look for patterns in the seat numbers of the middle seats in each row. Find as many as you can. Can you "convince a skeptic" that your patterns will continue? Can you find an equation or other simple method for finding the middle seat number in row r? Can you convince a skeptic that your equation or method always works?

9) What patterns do you notice about the location of odd and even numbered seats? Can you justify your patterns? Look for patterns in multiples of 3, 4 or other numbers

10) Pose and solve more problems based on this stadium problem.

11) Design a stadium with seats in a different configuration, and pose and solve problems about it.