EXPLORATIONS

Activity 11

Exponent Game

Materials

Paper clips to use as spinners

Getting Students Involved

Point out that in most games the winner is the player with the most points. But in this game, the winner is the player whose cumulative total is closest to 0.

♦ How might this variation in game rules alter how you play?

You have to think about letting the cumulative total be either positive or negative. Since ⁻2 is closer to zero than +5, you might have a negative cumulative total at some point during the game.

Making Mathematical Connections

Ask students whether they think 9^8 or 8^9 is greater. Ask for justifications for their choices. Then let students use their calculators to check.

♦ Why is 8^9 greater?

There are more factors to multiply.

Repeat the discussion for 2^4 and 4^2.

♦ Why do these two powers have the same value?

The base of 4 in the second expression can be factored as 2^2 so $4^2 = (2^2)^2 = 2^4$.

♦ Repeat the discussion for 5^1 and 1^5. Discuss why 5^1 is greater.

1 to any power is always 1, and any number to the power 1 is that number, so 5^1 is greater.

If necessary, review the use of [STO], [RCL], [SUM] or [SUM], and [EXC] keys.

➠ Transparency Masters A: Find the Sum of Numbers
                          B: Store and Recall Values
                          I: Exchange Memory with Display

Carrying Out the Investigation

Go over the rules of the game. You may want to play one or two rounds as a demonstration of the rules.

Making Sense of What Happened

After playing one or two games, have students discuss strategies that they think help them win. Discuss how they decide which power is greater.

Continuing the Investigation

Encourage students to make their own spinners.

♦ What numbers would make the game more challenging?

♦ How could the rules be changed to make the game more challenging?

Solutions

Not applicable.