

Magic Power of 11

1.) Simplify the following.

a.) 11^0 _____

c.) 11^2 _____

b.) 11^1 _____

d.) 11^3 _____

2.) Study your responses. What patterns do you see? Where have you observed these patterns before?

3.) Make predictions for 11^4 and 11^5 . Check your predictions with your calculator. If your predictions are incorrect, circle the incorrect and write the correct answer.

4.) Numbers can be broken down according to place value into smaller numbers whose sum will be the original number. For example, 375 would be:

hundreds	tens	one
300	70	5

Make a similar table that includes the powers of 11 from 0 to 7.

- 5.) What happens to the pattern when you consider Pascal's triangle?
- 6.) Rewrite the numbers from row 5 in the triangle according to place value and add them. Start with the 1 on the right as the ones digit and assume each number to the immediate left is the next place value. For example, if a 13 would appear in the hundreds spot that would mean you have 13 100s.
- 7.) Repeat the above exercise for row 6.
- 8.) Now consider the triangle. How could 11^5 and 11^6 be calculated using only the triangle?
- 9.) Make a predict for 11^7 . Check your answer with your calculator. If incorrect, circle your prediction and write the correct answer. Explain what went wrong.
- 10.) Pretend you are writing a memo to your boss. Explain how to use Pascal's triangle to find the powers of 11. Be sure to include in your response how to overcome place value problems that appear after row 4.