

MathFLIX CHALLENGE

What's the Difference between $2n$ & 2^n ?

Observe the patterns in each column and complete the table to discover the difference between the two algebraic expressions.

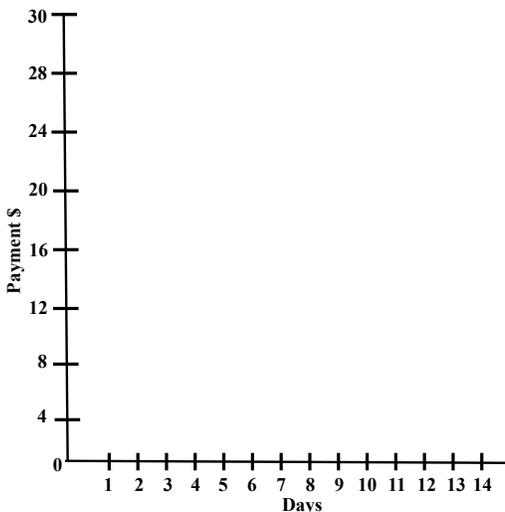
| Successive Whole # | Algebraic Expression | Addition | Simplified Form | Successive Whole # | Algebraic Expression | Multiplication | Simplified Form |
|--------------------|----------------------|---------------------|-----------------|--------------------|----------------------|------------------|-----------------|
| 0 | (2)(0) | Zero additions of 2 | 0 | 0 | 2^0 | x^0 always = 1 | |
| 1 | (2)(1) | 2 | 2 | 1 | 2^1 | 2 | |
| 2 | (2)(2) | $2 + 2$ | 4 | 2 | 2^2 | 2×2 | |
| 3 | (2)(3) | $2 + 2 + 2$ | | 3 | | | |
| 4 | (2)(4) | | | 4 | | | |
| 5 | (2)(5) | | | 5 | | | |

Number Sequences - Successive numbers are generated using a uniform rule.

What is the rule for $2n$? (Write your answer on the reverse side) This is an arithmetic sequence.

What is the rule for 2^n ? (Write your answer on the reverse side) This is a geometric sequence.

Diane needs to hire a dog walker for two weeks. Wendy charges \$2 per day. Brian charges \$0.01 for the first day, \$0.02 for the second day, \$0.04 for the third day, doubling the amount daily. Complete the table to help Diane decide whom to hire for the dog walking job then graph Wendy's payment in red and Brian's in blue.



| Day | Wendy | | Brian | |
|-----|------------|--------------------|------------|--------------------|
| | Daily Rate | Cumulative Payment | Daily Rate | Cumulative Payment |
| 1 | \$2 | \$2 | \$0.01 | \$0.01 |
| 2 | 2 | \$4 | 0.02 | 0.03 |
| 3 | 2 | \$6 | 0.04 | 0.07 |
| 4 | 2 | \$8 | 0.08 | 0.15 |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |