Practice 14.3

Evaluate each combination. Use the formula and then check your answers with your calculator.

1. $_{11}C_5$
2. $_{13}C_8$
3. $_{10}C_6$
4. $_{10}C_4$

Find each term described.

5) 4th term in expansion of $(2x - 1)^3$

6) 1st term in expansion of $(4x - 2y)^4$

7) 3rd term in expansion of $(y + 3)^4$

8) 2nd term in expansion of $(2u + v)^4$

9) 5th term in expansion of $(x + 2y)^4$

10) 3rd term in expansion of $(y - 5x)^3$

Expand completely.

11) $(2n - 1)^3$

12) $(1 + 3y)^3$

13) $(x - 4y)^4$

14) $(x + 4)^4$

15) $(y - 3x)^5$

Application 14.3 The Binomial Theorem

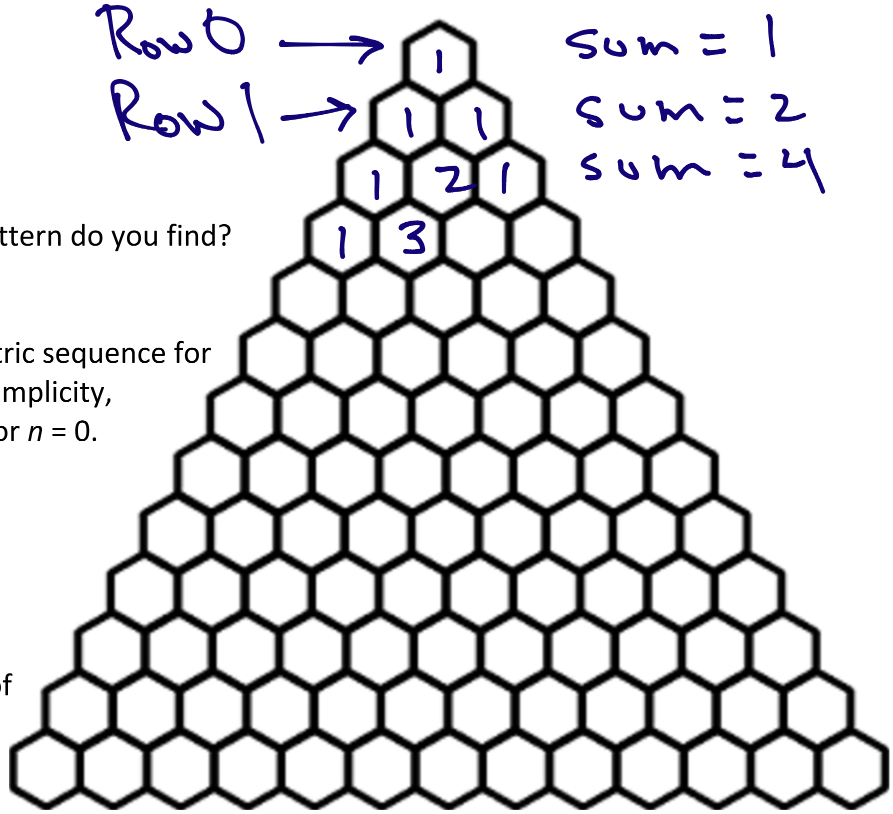
1. Expand completely: $(7x - 3y)^5$

2. Evaluate: ${}_{13}C_0$

3. a. Complete Pascal's Triangle

Row 0 →

Row 1 →



sum = 1

sum = 2

sum = 4

b. Add across the rows. What pattern do you find?

c. Write the pattern as a geometric sequence for the sum of the **n**th row. For simplicity, assume the top row is row 0, or n = 0.

Use a_n = ____________

d. Find the sum of the 20th row of Pascals triangle.

e. *That was too easy!* Find the sum of the first 100 rows of Pascal's triangle!

$$\boxed{S_n = a_1\left(\frac{1-r^n}{1-r}\right)}$$

f. Find the Fibonacci sequence in Pascal's triangle.

g. Sully loves to color. On the next page, color over each number that is even. What pattern do you see? *(Boo-yah! You've just been Sierpinskied!)*

Skillz Review! Write the equation of a line with the given slope that passes through the given point.			
In slope-intercept form: $y = mx + b$		**In point-slope form:** $y - y_1 = m(x - x_1)$	
1. slope = $\frac{3}{5}$; through (-15,-3)	**2.** slope = 0; through (7,6)	**3.** slope = 2; through (4,-1)	**4.** slope = $-\frac{1}{8}$; through (🍎,π)

14.3 The Binomial Theorem

1

1 1

1 [illegible] 1

1 3 3 1

1 [illegible] 1

1 5 [illegible] [illegible] 5 1

1 6 15 [illegible] 15 6 1

1 7 21 35 35 21 7 1

1 8 28 56 70 56 28 8 1

1 9 36 84 126 126 84 36 9 1

1 10 45 120 210 252 210 120 45 10 1

1 11 55 165 330 462 462 330 165 55 11 1

1 12 66 220 495 792 924 792 495 220 66 12 1

1 13 78 286 715 1287 1716 1716 1287 715 286 78 13 1

1 14 91 364 1001 2002 3003 3432 3003 2002 1001 364 91 14 1

1 15 105 455 1365 3003 5005 6435 6435 5005 3003 1365 455 105 15 1

1 16 120 560 1820 4368 8008 11440 12870 11440 8008 4368 1820 560 120 16 1

1 17 136 680 2380 6188 12376 19448 24310 24310 19448 12376 6188 2380 680 136 17 1

1 18 153 816 3060 8568 18564 31824 43758 48620 43758 31824 18564 8568 3060 816 153 18 1

1 19 171 969 3876 11628 27132 50388 75582 92378 92378 75582 50388 27132 11628 3876 969 171 19 1

1 20 190 1140 4845 15504 38760 77520 125970 167960 184756 167960 125970 77520 38760 15504 4845 1140 190 20 1

1 21 210 1330 5985 20349 54264 116280 203490 293930 352716 352716 293930 203490 116280 54264 20349 5985 1330 210 21 1

1 22 231 1540 7315 26334 74613 170544 319770 497420 646646 705432 646646 497420 319770 170544 74613 26334 7315 1540 231 22 1

1 23 253 1771 8855 33649 100947 245157 490314 817190 1144066 1352078 1352078 1144066 817190 490314 245157 100947 33649 8855 1771 253 23 1

1 24 276 2024 10626 42504 134596 346104 735471 1307504 1961256 2496144 2704156 2496144 1961256 1307504 735471 346104 134596 42504 10626 2024 276 24 1

1 25 300 2300 12650 53130 177100 480700 1081575 2042975 3268760 4457400 5200300 5200300 4457400 3268760 2042975 1081575 480700 177100 53130 12650 2300 300 25 1

1 26 325 2600 14950 65780 230230 657800 1562275 3124550 5311735 7726160 9657700 10400600 9657700 7726160 5311735 3124550 1562275 657800 230230 65780 14950 2600 325 26 1

1 27 351 2925 17550 80730 296010 888030 2220075 4686825 8436285 13037895 17383860 20058300 20058300 17383860 13037895 8436285 4686825 2220075 888030 296010 80730 17550 2925 351 27 1

1 28 378 3276 20475 98280 376740 1184040 3108105 6906900 13123110 21474180 30421755 37442160 40116600 37442160 30421755 21474180 13123110 6906900 3108105 1184040 376740 98280 20475 3276 378 28 1

1 29 406 3654 23751 118755 475020 1560780 4292145 10015005 20030010 34597290 51895935 67863915 77558760 77558760 67863915 51895935 34597290 20030010 10015005 4292145 1560780 475020 118755 23751 3654 406 29 1

Color all of the even numbers....