

Name: Answer Key No. 0
 Serafino · Precalculus S2

Per: 3/7 Date: 4/25/16
 (M) T W R F

9C-SC Binomial Theorem / Expansion
 Skills Check

Show all set ups/work for maximum credit.

1. Recall Pascal's Triangle...

- a. What is the 1st row? 1, 1
 b. What is the 6th row? 1, 6, 15, 20, 15, 6, 1
 c. What is the 3rd term in the 7th row? $7C2 = 21$
 d. ${}_{11}C_4$ is the 11th row, 5th term.
 e. The 17th row has 18 terms.
 f. In the 25th row, the 17th term = the 8th term.

2. Consider the expanded polynomial of $(a + b)^5$...

- a. Number of terms: 6 First term: a^5 Last term? b^5
 b. The set-up for the 5th term is: $5C4 (a)^1 (b)^4$

3. In the expansion of $(2s - t^2)^{15}$...

- a. The 7th term contains $s^9 t^{12}$ $(2s)^9 (-t^2)^6$
 b. 12th term: $-21840 s^4 t^{22}$
 ${}_{15}C_{11} (2s)^4 (-t^2)^{11}$
 $1365 (16s^4) (-t^{22})$
 d. 13th term: $3640 s^3 t^{24}$
 ${}_{15}C_{12} (2s)^3 (-t^2)^{12}$
 $455 (8s^3) (t^{24})$

4. Find the 3rd term for the following polynomials:

- a. $\left(\frac{3}{4}p + 2\sqrt{q}\right)^4$ $\frac{27}{2} p^2 q$
 $4C2 \left(\frac{3}{4}p\right)^2 (2\sqrt{q})^2$
 $6 \left(\frac{9}{16}p\right) (4q)$
 b. $(x^3 - x^2)^9$ $36x^{25}$
 $9C2 (x^3)^7 (-x^2)^2$
 $36 x^{21} x^4$

5. Fully expand the following:

- a. $(x-3)^3 = \cancel{1(x^3)} \cancel{3(x^2)(-3)} \cancel{3x(-3)^2} \cancel{1(-3)^3}$
 $x^3 - 9x^2 + 27x - 27$
 b. $(2x^2 + y)^2 = \cancel{1(2x^2)^2} \cancel{2(2x^2)(y)} \cancel{1(y^2)}$
 $4x^4 + 4x^2y + y^2$

Not a bonus: What is the constant term when $\left(x^2 - \frac{2}{x}\right)^3$ is expanded. 12

$\cancel{1(x^2)^3} \cancel{3(x^2)^2 \left(-\frac{2}{x}\right)} \cancel{3(x^2) \left(-\frac{2}{x}\right)^2} \cancel{1\left(-\frac{2}{x}\right)^3}$
 $x^6 - 6x^3 + 12 - \frac{8}{x^3} \Rightarrow x^3 - \frac{6x^4}{x} + \frac{12x^2}{x^2} - \frac{8}{x^3}$