

Solutions

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1. The first four entries of the 12th row of Pascal's triangle are 1, 12, 66, and 220.
Determine the first four entries of the 13th row of the triangle.

$$\begin{array}{cccc} & & 1 & 12 & 66 & 220 \\ & & \checkmark & \checkmark & \checkmark & \\ = & 1 & 13 & 78 & 286 & \end{array}$$

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2. Expand and simplify each binomial power.

a) $(x + 2)^5$

$$= 1(x)^5(2)^0 + 5(x)^4(2)^1$$

$$+ 10(x)^3(2)^2 + 10(x)^2(2)^3$$

$$+ 5(x)^1(2)^4 + 1(x)^0(2)^5$$

$$= x^5 + 10x^4 + 40x^3 + 80x^2 + 80x + 32$$

$$\begin{array}{ccccccc}
 & & & & 1 & & & & \\
 & & & & 1 & & 1 & & \\
 & & & 1 & 2 & 1 & & & \\
 & & 1 & 3 & 3 & 1 & & & \\
 & 1 & 4 & 6 & 4 & 1 & & & \\
 1 & 5 & 10 & 10 & 5 & 1 & & &
 \end{array}$$

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4. Expand and simplify each binomial power.

K a) $(k + 3)^4$

$$= 1(k)^4(3)^0 + 4(k)^3(3)^1$$

$$+ 6(k)^2(3)^2 + 4(k)^1(3)^3 + 1(k)^0(3)^4$$

$$= k^4 + 12k^3 + 54k^2 + 108k + 81$$

$$\begin{array}{ccccccc}
 & & & & 1 & & & & \\
 & & & & 1 & & 1 & & \\
 & & & 1 & 2 & 1 & & & \\
 & & 1 & 3 & 3 & 1 & & & \\
 & 1 & 4 & 6 & 4 & 1 & & &
 \end{array}$$

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4. Expand and simplify each binomial power.

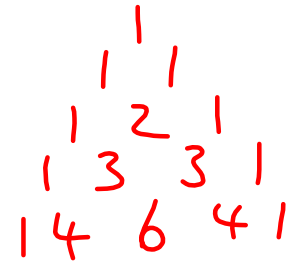
K

c) $(3q - 4)^4$

$$= 1(3q)^4(-4)^0 + 4(3q)^3(-4)^1$$

$$+ 6(3q)^2(-4)^2 + 4(3q)^1(-4)^3 + 1(3q)^0(-4)^4$$

$$= 81q^4 - 432q^3 + 864q^2 - 768q + 256$$



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4. Expand and simplify each binomial power.

K

d) $(2x + 7y)^3$

$$= 1(2x)^3(7y)^0 + 3(2x)^2(7y)^1$$

$$+ 3(2x)^1(7y)^2 + 1(2x)^0(7y)^3$$

$$= 8x^3 + 84x^2y + 294xy^2 + 343y^3$$



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