**Math 30-1 Binomial Theorem Worksheet**

1. Expand each binomial and express in simplest form:

a) 

 b) 

 c) 

1. Determine an expression for the 6th term in the expansion of in simplified form.
2. The sixth term in the expansion of $\left(x+2y\right)^{12}$ can be expressed as

|  |  |  |  |
| --- | --- | --- | --- |
| a. $\left(\genfrac{}{}{0pt}{}{12}{6}\right)x^{6}\left(2y\right)^{6}$ | b. $\left(\genfrac{}{}{0pt}{}{12}{5}\right)x^{7}\left(2y^{5}\right)$ | c. $\left(\genfrac{}{}{0pt}{}{12}{5}\right)x^{7}\left(2y\right)^{5}$ | d. $\left(\genfrac{}{}{0pt}{}{12}{5}\right)x^{6}\left(2y^{6}\right)$ |

1. The numerical coefficient of the middle term in the expansion of $\left(3x^{2}-y\right)^{10}$ can be expressed as

|  |  |  |  |
| --- | --- | --- | --- |
| a. $-\left(\genfrac{}{}{0pt}{}{10}{5}\right)\left(3^{5}\right)$ | b. $\left(\genfrac{}{}{0pt}{}{10}{4}\right)\left(3^{4}\right)$ | c. $\left(\genfrac{}{}{0pt}{}{10}{5}\right)\left(3^{8}\right)$ | d. $\left(\genfrac{}{}{0pt}{}{10}{6}\right)\left(3^{4}\right)$ |

1. The first three terms of the expansion of $\left(1-3x\right)^{6}$ are

|  |  |  |  |
| --- | --- | --- | --- |
| a. $1-18x+135x^{2}$ | b. $1-18x+45x^{2}$ | c. $1-18x+270x^{2}$ | d. $1-18x-135x^{2}$ |
|  |  |  |  |

1. The simplified form of the 3rd term in the expansion of $\left(1-3x\right)^{10}$ is

|  |  |  |  |
| --- | --- | --- | --- |
| a. $-405x$ | b. $-405x^{3}$ | c. $-324x^{3}$ | d. $405x^{2}$ |

1. The coefficient of $x^{-2}$ in the expansion of $\left(x-\frac{1}{x^{4}}\right)^{13}$ is

|  |  |  |  |
| --- | --- | --- | --- |
| a. $\left(\genfrac{}{}{0pt}{}{13}{4}\right)$ | b. $\left(\genfrac{}{}{0pt}{}{13}{3}\right)$ | c. $-\left(\genfrac{}{}{0pt}{}{13}{3}\right)$ | d. There is not term containing $x^{-2}$ |

1. Determine an expression in simplified form for the next to last term of the expansion of .
2. The general term for the expansion of $\left(4+3x\right)^{8}$ is

|  |  |  |  |
| --- | --- | --- | --- |
| a. $\left(\genfrac{}{}{0pt}{}{8}{r}\right)$4●$x^{8-r}● 3x^{8}$ | b. $\left(\genfrac{}{}{0pt}{}{8}{r}\right)4^{8-r}● 3x^{r}$ | c. $3^{r}\left(\genfrac{}{}{0pt}{}{8}{r}\right)4^{8-r}● x^{r}$ | d. $\left(\genfrac{}{}{0pt}{}{8}{r}\right)12^{8-r}● x^{r}$ |

1. If the expansion of  has 18 terms, what is the value of *n*?
2. If the expansion of  has 18 terms, what is the value of *n*?
3. If there are 17 terms in the expansion of $\left(2x+3y\right)^{3n-5}$, then

|  |  |  |  |
| --- | --- | --- | --- |
| a. n = 5 | b. n = 18 | c. n = 7 | d.   |

1. The fifth term of the expansion of $\left( \frac{1}{x}-\sqrt{x}\right)^{10} is$

|  |  |  |  |
| --- | --- | --- | --- |
| a. $-\left(\genfrac{}{}{0pt}{}{10}{4}\right)\left(x^{-4}\right)$ | b. $-\left(\genfrac{}{}{0pt}{}{10}{6}\right)\left(x^{8}\right)$ | c. $\left(\genfrac{}{}{0pt}{}{10}{6}\right)\left(x^{-1}\right)$ | d. $\left(\genfrac{}{}{0pt}{}{10}{4}\right)\left(x^{-4}\right)$ |

1. One term in the expansion of  . Determine an expression for *m*.
2. A term of the expansion of , where *a* > 0, is . Determine the value of *a*.
3. The constant term in the expansion of $\left(x^{2}-\frac{1}{x}\right)^{12} $is the

|  |  |  |  |
| --- | --- | --- | --- |
| a. 9th term | b. 13th term | c. 8th term | d. 5th term |

1. What is the value of the constant term in the expansion of $\left(x^{2}+\frac{1}{x^{3}}\right)^{10}$?

|  |  |  |  |
| --- | --- | --- | --- |
| a. 120 | b. 210 | c. 252 | d. 300 |

1. What is the value of the constant term in the expansion of ?
2. What is the sum of the ninth row of Pascal’s Triangle?
3. What is the sum of the coefficients in the expansion of ?