

MPM2D – Unit 1 Test Review

Powers and Polynomials

Topics on the Test

- Types of polynomials (monomial, binomial, trinomial, polynomial)
- Degree of Terms and Polynomials (degree of term with highest degree)
- Parts of a polynomial (numerical and literal coefficients)
- Adding and Subtracting Polynomials
- Multiplying and Dividing Monomials
- Multiplying Binomials (distributive property/ FOIL)

- Perimeter, Area (of rectangles), and Volume (of cubes) questions
 - $P = \sum \text{sides}$
 - $A = (l)(w)$
 - $V = (l)(w)(h)$

- Power Laws
 - Product Law
 - Quotient Law
 - Power of a Power Law
 - Power of a Product Law
 - Power of a Quotient Law
 - Zero Exponent Law
 - Negative Exponents
 - Simplifying and Evaluating Powers

1. For each polynomial below, state the degree and the type of polynomial.

| Polynomial | Degree of Polynomial | Type of Polynomial |
|----------------------------------|----------------------|--------------------|
| $x^2 - 3x + 76$ | | |
| $x^2y^3 - 4x^2y^2 + 15xy^3 + 19$ | | |
| $a^2bc - a^2b^2c + abc^2 - 3abc$ | | |
| $46x^2y^3z$ | | |
| $75x - 32y^2$ | | |

2. Identify the numerical and literal coefficient of each term.

| Term | Numerical Coefficient | Literal Coefficient |
|----------|-----------------------|---------------------|
| $-xyz^3$ | | |
| 73 | | |
| 43mn | | |

3. Simplify each polynomial.

a. $(x^2 + 3x - 4) + (5x^2 - 6)$ b. $(-x^2 + 9x - 18) - (4x^2 + 8x - 10)$

4. Evaluate each polynomial at the given value of the variable.

a. $2z^3 - 4z^2 - 1$ at $z = -2$ b. $4xy^2 + 3y + 5$ at $x = 5$ and $y = 2$

5. Expand and simplify each product below.

a. $(x + 4)(x + 5)$

b. $(3x - 1)(x - 4)$

c. $(2x + 1)(5x + 4)$

d. $(7x - 2y)^2$

e. $(x - 4y)(x + 4y)$

6. Simplify each of the following.

a. $(4x^2y^3z)(-3xy^{-4}z^5)$

b. $(2abc)(-3a^2b)(9b^{-2}c^5)$

c. $\frac{-32a^5b^4c}{4a^4b^2c^3}$

d. $\frac{6x^7y^{-2}z^{11}}{24x^3y^{-3}z^{15}}$

7. Simplify each of the following into a single power. Write all final answers with positive exponents.

a. $(x^4)(x^6)$

b. $y^{12} \div y^7$

c. $(z^4)^{-9}$

d. $(abc)^0$

d. $\frac{(-2)^{10}}{(-2)^{15}}$

e. $(2x^2yz^3)^4$

d. $\left(\frac{3x^7}{y^9}\right)^4$

8. Evaluate each of the following.

a. $5w^0$

b. $\left(\frac{6}{7}\right)^{-2}$

c. $(-4)^3$

d. -6^0

e. -7^3

f. x^{-8}

g. $\frac{1}{3^{-2}}$

h. $4^{-2} + 5^{-2}$

i. $\left(-\frac{2}{3}\right)^{-4}$