### Foundations of Math & Pre-Calculus 10

#### Polynomials Review from Grade 9

<table>
<thead>
<tr>
<th>Skill</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognize the different parts of a polynomial.</td>
<td>A polynomial may have variable terms and a constant term. The number in front of a variable is its coefficient.</td>
<td>Variable term: $3x^2 + 2x + 4$ coefficient $4$ constant $2x$ variable terms $3x^2$ variable term $3$</td>
</tr>
</tbody>
</table>
| Describe and classify polynomials.         | A polynomial can be classified by its number of terms and by its term with the greatest degree. | Monomial: $3x$  
Binomial: $2x + 5$  
Trinomial: $x^2 + 2x - 1$ degree $2$ |
| Use algebra tiles to represent a polynomial. | We use these tiles: [Tiles Diagram] A pair of tiles with the same shape and size, but different colours forms a zero pair. The tiles model $0$. | $x^2 + 2x - 1$ [Tiles Diagram] |
| Simplify polynomials by combining like terms. | To simplify a polynomial, add the coefficients of like terms. | Like terms: $4x^2$ and $-2x^2$  
Unlike terms: $3x$ and $-5$  
$4x^2 - 2x^2 = 2x^2$ |
| Add polynomials.                           | To add polynomials, remove the brackets and add the coefficients of like terms. | $(4x^2 + 3x) + (x^2 - 5x)$  
$= 4x^2 + 3x + x^2 - 5x$  
$= 4x^2 + x^2 + 3x - 5x$  
$= 5x^2 - 2x$ |
| Subtract polynomials.                      | To subtract a polynomial, add the opposite terms. | $(3x^2 + 5x) - (2x^2 - x)$  
$= 3x^2 + 5x + (-2x^2 + x)$  
$= 3x^2 + 5x - 2x^2 + x$  
$= 3x^2 - 2x^2 + 5x + x$  
$= x^2 + 6x$ |
| Multiply a polynomial by a monomial.       | To multiply a polynomial by a monomial, use the distributive property. | $3x(6x - 5)$  
$= 3x(6x) + (3x)(-5)$  
$= 18x^2 + (-15x)$  
$= 18x^2 - 15x$ |
| Divide a polynomial by a monomial.         | To divide a polynomial by a monomial, divide each term of the polynomial by the monomial. | $\frac{24x^2 - 32x}{8x} = \frac{24x^2}{8x} + \frac{-32x}{8x}$  
$= 3x - 4$ |
1. Is the polynomial a monomial, binomial, or trinomial?
   a) \(-3s^2 + 11\) **binomial**   b) \(8d\) **monomial**
   c) \(2e^2 - 9e + 7\) **trinomial**   d) \(8h - 1\) **binomial**

2. Sketch algebra tiles to model each polynomial.
   a) \(3k - 4\)
   b) \(2m^2 - m + 3\)
   c) \(-n^2 + 5n - 2\)

3. Simplify each polynomial.
   a) \(-7d - 4 + 8d + 2\) = \(d - 2\)
   b) \(3e^2 - 8e + 2e^2 + 11e\) = \(5e^2 + 3e\)
   c) \(13 - 6h + 2h^2 + 7h - 9\) = \(2h^2 + h + 4\)
   d) \(-9k^2 + 15k - 8 - 2k^2 - 4k + 3\) = \(-11k^2 + 11k - 5\)

6. Add.
   a) \((7r + 11) + (-2r + 3)\) = \(5r + 14\)
   b) \((-9s^2 + 5s) + (16s^2 - 9s - 14)\) = \(7s^2 - 4s - 14\)
8. Subtract.
   a) \((6v + 5) - (13v - 3)\)
   \[= -7v + 8\]
   b) \((10w^2 - 7) - (-2w + 9w^2 + 5)\)
   \[= w^2 + 2w - 12\]

10. Multiply.
   a) \(6(-7y^2 + 1)\)
   \[= -42y^2 + 6\]
   b) \(-9(-2z^2 - 4z + 5)\)
   \[= 18z^2 + 36z - 45\]

11. Divide.
   a) \(\frac{16a - 40}{8}\)
   \[= 2a - 5\]
   b) \(\frac{27b^2 - 9b + 36}{-9}\)
   \[= -3b^2 + b - 4\]

   a) \(3e(5e - 2)\)
   \[= 15e^2 - 6e\]
   b) \(-4f(5f + 2)\)
   \[= -20f^2 - 8f\]

   a) \(\frac{-21k^2}{7k}\)
   \[= -3k\]
   b) \(\frac{81m^2 - 45m}{-9m}\)
   \[= -9m + 5\]
   c) \(\frac{-33n^2 + 36n}{-3n}\)
   \[= 11n - 12\]
ACROSS
3. the numerical factor of a term
4. one term or the sum of terms whose variables have whole-number exponents
5. a mathematical statement made up of numbers and/or variables connected by operations
7. a polynomial with one term
9. terms that have the same variable (two words)
10. a letter or symbol representing a quantity that can vary
11. a polynomial with three terms

DOWN
1. a number, a variable, or the product of numbers and variables
2. the value of the greatest exponent of a term in a polynomial
3. the number in an expression or equation that does not change
6. a polynomial with two terms
8. a mathematical statement that two expressions are equal