Answer Key

Polynomials

1) Answer: B
Explanation: A quadratic polynomial is a polynomial which is in second degree. This means that the highest exponent of its variable is 2. Among the given options, only $x^2 + 6x - 1$ is quadratic.

2) Answer: A
Explanation: We can apply the distributive property to multiply a monomial by a binomial.

Using the distributive property:
$-2x(x - 9)$
$-2x(x) - (-2x)(9)$ *Distributive Property*
$-2x^2 + 18x$

Hence, the answer is $-2x^2 + 18x$

3) Answer: C
Explanation: To add polynomials, we put like terms of the polynomials in a column and then add them together. The given polynomials are $3xy^2 + 2x + z$ and $xy^2 - z$. If we put like terms of the polynomials in column and add them together:

$$\begin{array}{rr} & 3xy^2 + 2x + z \\ + & xy^2 \quad\quad - z \\ \hline & 4xy^2 + 2x \end{array}$$

4) Answer: A
Explanation: If a polynomial has more than one variable involved for each term, we add the exponents of each term first:
$-3x^4y^2$ (sum of exponents: 4 + 2 = 6)
$2x^2y^3$ (sum of exponents: 2 + 3 = 5)
$-x^3y^4$ (sum of exponents: 3 + 4 = 7)

Now, we arrange the terms based on the sums of the exponents:
$-x^3y^4 - 3x^4y^2 + 2x^2y^3$

The answer is $-x^3y^4 - 3x^4y^2 + 2x^2y^3$

5) Answer: D
Explanation: The given polynomial is $2x^3 + 4x^k - 3 = 0$. Our goal is to make the degree of this polynomial higher than that of a cubic polynomial. A cubic polynomial is a polynomial in third degree. This means that the degree of $2x^3 + 4x^k - 3 = 0$ must be higher than 3. This will be achieved if k is greater than 3. The smallest whole number greater than 3 is 4. Thus $k = 4$.