

$$1.) (a^2 - b^3)^5 =$$

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

$$1(a^2)^5 - 5(a^2)^4(b^3)^1 + 10(a^2)^3(b^3)^2 - 10(a^2)^2(b^3)^3 + 5(a^2)(b^3)^4 - 1(b^3)^5$$

$$1(a^{10}) - 5(a^8)(b^3) + 10(a^6)(b^6) - 10(a^4)(b^9) + 5(a^2)(b^{12}) - 1(b^{15}) =$$

$$1a^{10} - 5a^8b^3 - 10a^6b^6 - 10a^4b^9 + 5a^2b^{12} - 1(b^{15})$$

$$2) (m^3 + 2n^4)^7$$

$$\begin{array}{ccccccc}
 & & & & 1 & & \\
 & & & & 7 & & \\
 & & & 1 & 6 & & \\
 & & 1 & 6 & 21 & & \\
 & 1 & 6 & 21 & 35 & 21 & 6 & 1 \\
 & 1 & 7 & 21 & 35 & 21 & 7 & 1
 \end{array}$$

$$\begin{aligned}
 & 1(m^3)^7 + 7(m^3)^6(2n^4) + 21(m^3)^5(2n^4)^2 + 35(m^3)^4 \\
 & (2n^4)^3 + 35(m^3)^3(2n^4)^4 + 21(m^3)^2(2n^4)^5 \\
 & + 7(m^3)(2n^4)^6 + 1(2n^4)^7
 \end{aligned}$$

$$\begin{aligned}
 & 1(m^7) + 7(m^3)(2n^4) + 21(m^6)(2n^8) + 35(m^{12})(2n^{12}) \\
 & + 35(m^{10})(2n^{16}) + 21(m^6)(2n^{20}) + 7(m^3)(2n^{24}) \\
 & + 1(2n^{28})
 \end{aligned}$$

$$\begin{aligned}
 & (m^7) + 14m^3n^4 + 42m^6n^8 + 70m^{12}n^{12} + 70m^9n^{16} + 42m^6 \\
 & 14m^3n^{24} + 2n^{28}
 \end{aligned}$$

$$3.) (3x^4 - 2y)^4$$

$$\begin{array}{c} 1 \\ 11 \\ 121 \\ 1331 \\ 14641 \end{array}$$

$$1(3x^4)^4 - 4(3x^4)^3(2y) + 6(3x^4)^2(2y)^2 - 4(3x^4)^1(2y)^3 + 1(2y)^4$$

$$1(3x^4) - 4(3x^3)(2y) + 6(3x^2)(2y^2) - 4(3x)(2y^3) + 1(2yx)$$

$$3x^4 - 24x^3y + 36x^2y^2 - 24xy^3 + 2y^4$$

$$4.) (5m - 2n)^5 =$$

$$\begin{array}{c} 1 \\ 11 \\ 121 \\ 1331 \\ 14641 \\ 16101051 \end{array}$$

$$1(5m)^5 - 5(5m)^4(2n) + 10(5m)^3(2n)^2 - 10(5m)^2(2n)^3 + 5(5m)(2n)^4 - 1(2n)^5$$

$$5m - 5m^4n + 100m^3n^2 - 100m^2n^3 + 50mn^4 - 2n^5$$

$$5) (2x^3 - 3y^2)^6$$

$$\begin{array}{ccccccc} & & & & 1 & & \\ & & & & 6 & & \\ & & & 15 & 20 & 15 & 6 & 1 \\ & & 1 & 6 & 15 & 20 & 15 & 6 & 1 \\ & 1 & 6 & 15 & 20 & 15 & 6 & 1 \\ & 1 & 6 & 15 & 20 & 15 & 6 & 1 \\ & 1 & 6 & 15 & 20 & 15 & 6 & 1 \\ & 1 & 6 & 15 & 20 & 15 & 6 & 1 \end{array}$$

$$1(2x^3)^6 - 6(2x^3)^5(3y^2) + 15(2x^3)^4(3y^2)^2 - 20(2x^3)^3(3y^2)^3 + 15(2x^3)^2(3y^2)^4 - 6(2x^3)(3y^2)^5 + 1(3y^2)^6$$

$$1(2x^{18}) - 6(2x^{15})(3y^2) + 15(2x^{12})(3y^2)^2 - 20(2x^9)(3y^2)^3 + 15(2x^6)(3y^2)^4 - 6(2x^3)(3y^2)^5 + 1(3y^2)^6$$

$$2x^{18} - 36x^{15}y^2 + 90x^{12}y^4 - 120x^9y^6 + 90x^6y^8 - 36x^3y^{10} + 3y^{12}$$