

[Platform]

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

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

$$\downarrow$$
$$a^8 - 5a^8b^3 + 10a^6b^6 - 10a^4b^9 + 5a^2b^{12} - 15$$

R/// $-b^{15} + 5a^2b^{12} - 10a^4b^9 + 10a^6b^6 - 5a^8b^3 + a^{10}$

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

$$(m^3)^7 + 7(m^3)^6(2n^4) + 21(m^3)^5(2n^4)^2 + 35(m^3)^4(2n^4)^3 + 35(m^3)^3(2n^4)^4 + 21(m^3)^2(2n^4)^5 + 7m^3(2n^4)^6 + (2n^4)^7$$

$$\downarrow$$
$$m^{21} + 14m^{18}n^4 + 84m^{15}n^8 + 280m^{12}n^{12} + 560m^9n^{16} + 672m^6n^{20} + 448m^3n^{24} + 128n^{28}$$

$\downarrow$

$$R/// 128n^{23} + 44m^3n^{24} + 672m^5n^{20} + 560m^9n^{12} + 280m^{12}n^{12} + 84m^{15}n^8 + 14m^{18}n^4 + m^{22}$$

$$\begin{aligned} 3) \quad & (3x - 2y)^4 \\ & \downarrow \\ & 3x \times 4 - 2y \times 4 \\ & \downarrow \\ & 12x - y \times 4 \\ & \downarrow \end{aligned}$$

$$R/// 12x - 8y$$

$$4) \quad (5m - 2n)^5$$

$$(5m - 2n)^{3+2}$$

$$\downarrow$$

$$(5m - 2n)^3 \times (5m - 2n)^2$$

$$\downarrow$$

$$(125m^3 - 150m^2n + 60mn^2 - 8n^3) \times (5m - 2n)$$

$$\downarrow$$

$$(125m^3 - 150m^2n + 60mn^2 - 8n^3) \times (25m^2 - 20mn + 4n^2)$$

$$5) (2x^3 - 3y^4)^5$$

$$(2x^3 - 3y^4)^{3+5}$$

$$(2x^3 - 3y^4)^3 \times (2x^3 - 3y^4)^2$$

$$(8x^9 - 36x^6y^4 + 54x^3y^8 - 27y^{12}) \times (2x^3 - 3y^4)^2$$

$$(8x^9 - 36x^6y^4 + 54x^3y^8 - 27y^{12}) \times (4x^6 - 12x^3y^4 + 9y^8)$$

$$32x^{15} - 240x^{12}y^4 + 720x^9y^8 - 1080x^6y^{12} + 486x^3y^{16} + 324x^3y^{16} - 243y^{20}$$

$$\text{R// } 32x^{15} - 240x^{12}y^4 + 720x^9y^8 - 1080x^6y^{12} + 818^3y^{16} - 243y^{20}$$

$$3125m^5 - 2500m^4n + 500m^3n^2 - 3750m^2n^3 + 300m^3n^2 \\ - 600m^2n^3 + 750m^3n^2 - 1200m^2n^3 + 240mn^4 \\ - 200m^2n^3 + 160mn^4 - 32n^5$$

$$\downarrow \\ 3125m^5 - 6250m^4n + 500m^3n^2 + 3000m^3n^2 \\ - 600m^2n^3 + 750m^3n^2 - 1200m^2n^3 + 240mn^4 \\ - 200m^2n^3 + 160mn^4 - 32n^5$$

$$\downarrow \\ 3125m^5 - 6250m^4n + 5000m^3n^2 - 600m^2n^3 \\ + 240mn^4 - 200m^2n^3 + 160mn^4 - 32n^5$$

$$\downarrow \\ 3125m^5 - 6250m^4n + 5000m^3n^2 - 200m^2n^3 \\ + 240mn^4 + 160mn^4 - 32n^5$$

$$\text{R.I.} \quad 3125m^5 - 6250m^4n + 5000m^3n^2 - 200m^2n^3 \\ + 400mn^4 - 32n^5$$