

$$\begin{aligned}
 4. \left(\frac{4x^{-3}y^2}{xy^{-5}} \right)^{-2} &= \frac{4^{-2} x^6 y^{-4}}{x^{-2} y^{10}} = 4^{-2} x^8 y^{-14} \\
 &= \frac{x^8}{4^2 y^{14}} \\
 &= \frac{x^8}{16y^{14}}
 \end{aligned}$$

$$12. -5ab^2(-3a^2b + 6a^3b - 3a^4b^4)$$

$$15a^3b^3 - 30a^4b^3 + 15a^5b^6$$

$$23. \frac{12x^4 - 20x^3 + 9x + 35}{3x - 5}$$

$$\begin{array}{r} 4x^3 + 3 + \frac{50}{3x-5} \\ 3x-5 \overline{) 12x^4 - 20x^3 + 0x^2 + 9x + 35} \\ \underline{(-) 12x^4 - 20x^3} \\ 0x^3 + 0x^2 + 9x + 35 \\ \underline{(-) 9x - 15} \\ 50 \end{array} \quad \begin{array}{l} \frac{12x^4}{3x} = 4x^3 \\ \frac{9x}{3x} = 3 \end{array}$$

$$21. \frac{(3x^4 + 4x^3 - 32x^2 - 5x - 20)(x+4)^{-1}}{x+4}$$

$$\begin{array}{r} -4 \overline{) 3 \quad 4 \quad -32 \quad -5 \quad -20} \\ \downarrow \quad -12 \quad 32 \quad 0 \quad 20 \\ \hline 3 \quad -8 \quad 0 \quad -5 \quad | \quad 0 \end{array}$$

$$3x^3 - 8x^2 - 5$$

$$(5b) \quad (2xy^3)(-3x^{-1}y^{-3})$$

$$19. \frac{24mn^6 - 40m^2n^3}{4m^2n^3}$$

$$\begin{array}{rcl} \frac{24mn^6}{4m^2n^3} & - & \frac{40m^2n^3}{4m^2n^3} \\ 6m^{-1}n^3 & - & 10m^0n^0 \\ & & - 10(1)(1) \\ \frac{6n^3}{m} & - & 10 \end{array}$$

$$9. (4x^2 - 3y^2 + 5xy) - 1(8xy + 3y^2)$$

$$\begin{array}{r} 4x^2 - \underline{3y^2} + \underline{5xy} - \underline{8xy} - \underline{3y^2} \\ \hline 4x^2 - 6y^2 - 3xy \end{array}$$

$$22. \quad \frac{(8x^4 - 4x^2 + x + 4)}{2} \div \frac{(2x+1)}{2}$$

$$(4x^4 - 2x^2 + \frac{1}{2}x + 2) \left(x + \frac{1}{2}\right)$$

$$\begin{array}{r|rrrrrr} -\frac{1}{2} & 4 & 0 & -2 & \frac{1}{2} & 2 \\ & \downarrow & -2 & 1 & \frac{1}{2} & -\frac{1}{2} \\ \hline & 4 & -2 & -1 & 1 & \frac{3}{2} \end{array}$$

$$+ \frac{\frac{3}{2}}{x + \frac{1}{2}} \times 2$$

$$4x^3 - 2x^2 - x + 1 + \frac{3}{2x+1}$$