

$$1: \frac{(3a^3 + 5a^2 - 4)}{(3a)} = \frac{3a^3 + 5a^2}{3a} + \frac{-4}{3a}$$

$$= \frac{a^3}{a} + \frac{5a^2}{3a} + \frac{-4}{3a} = a^2 + \frac{5a}{3a} + \frac{-4}{3a}$$

$$= a^2 + \frac{5a}{3} + \frac{-4}{3a} \rightarrow \boxed{a^2 + \frac{5a}{3} - \frac{4}{3a}}$$

$$2: \left( \frac{2}{3} a^2 b^2 - \frac{1}{4} a^2 b^4 + \frac{5}{6} a b^4 - \frac{2}{5} b^5 \right)$$

$$\left( -\frac{1}{2} a b^2 \right)$$

$$= b^2 \frac{40a^2 - 15a^2 b^2 + 50ab^2 - 24b^3}{60}$$

$$= b^2 \frac{40a^2 - 15a^2 b^2 + 50ab^2 - 24b^3}{60}$$

$$= \left( \frac{b^2(40a^2 - 15a^2 b^2 + 50ab^2 - 24b^3)}{60} \right) \left( -\frac{2}{b^2 a} \right)$$

$$= - \left( \frac{40a^2 - 15a^2 b^2 + 50ab^2 - 24b^3}{60} \right) \left( \frac{2}{a} \right)$$

$$= \left( \frac{40a^2 - 15a^2 b^2 + 50ab^2 - 24b^3}{30} \right) \left( \frac{1}{a} \right)$$

$$= \frac{40a^2 - 15a^2 b^2 + 50ab^2 - 24b^3}{30a}$$

$$= \left( \frac{40a^2}{30a} - \frac{15a^2 b^2}{30a} + \frac{50ab^2}{30a} - \frac{24b^3}{30a} \right)$$

$$= \left( \frac{4a}{3} + \frac{-15a^2 b^2}{30a} + \frac{50ab^2}{30a} + \frac{-24b^3}{30a} \right)$$

$$= \left( \frac{4a}{3} - \frac{ab^2}{2} + \frac{5ab^2}{3a} - \frac{24b^3}{30a} \right)$$

$$\rightarrow \left( \frac{4a}{3} - \frac{ab^2}{2} + \frac{5b^2}{3} - \frac{4b^3}{5a} \right)$$

$$3: \left( \frac{x^4 - 2x^3 - 11x^2 + 30x - 20}{(x^2 + 3x - 2)} \right)$$

$$= *x^2 + 3x2 \overline{) x^4 - 2x^3 - 11x^2 + 30x - 20}$$

$$\quad \underline{-x^4 - 3x^3 + 2x^2}$$

$$\quad \quad \underline{-5x^3 - 9x^2 + 30x}$$

$$\quad \quad \underline{-5x^3 - 15x^2 - 10x}$$

$$\quad \quad \quad \underline{+6x^2 + 20x - 20}$$

$$\quad \quad \quad \underline{+6x^2 - 18x + 12}$$

$$\quad \quad \quad \quad \underline{+2x - 8} *$$

$$\rightarrow x^2 - 5x + 6 + \frac{2x - 8}{x^2 + 3x - 2}$$

$$4: \left( \frac{x^6 + 5x^4 + 3x^2 - 2x}{x^2 - x + 3} \right)$$

$$\begin{array}{r}
 x^4 + x^3 + 0x^2 - 6x^* \\
 *x^2 - x + 3 \overline{) x^6 + 0x^5 + 5x^4 + 0x^3 + 3x^2 - 2x + 0} \\
 \underline{-x^6 + x^5 - 3x^4} \phantom{+ 0x^3 + 3x^2 - 2x + 0} \\
 + x^5 + 2x^4 + 0x^3 \phantom{+ 3x^2 - 2x + 0} \\
 \underline{-x^5 + x^4 - 3x^3} \phantom{+ 3x^2 - 2x + 0} \\
 + 3x^4 - 3x^3 + 3x^2 \phantom{- 2x + 0} \\
 \underline{-3x^4 + 3x^3 - 9x^2} \phantom{- 2x + 0} \\
 -6x^2 - 2x + 0 \\
 \underline{+6x^2 - 6x + 18} \\
 -8x + 18^* \\
 \hline
 \rightarrow x^4 + x^3 + 3x^2 - 6 + \frac{-8x + 18}{x^2 - x + 3}
 \end{array}$$

$$5: \left( \frac{2x^4 - 2x^3 + 3x^2 + 5x + 10}{x + 2} \right)$$

$$\begin{array}{r}
 2x^3 - 6x^2 + 15x - 25^* \\
 *x + 2 \overline{) 2x^4 - 2x^3 + 3x^2 + 5x + 10} \\
 \underline{-2x^4 - 4x^3} \phantom{+ 3x^2 + 5x + 10} \\
 -6x^3 + 3x^2 \phantom{+ 5x + 10} \\
 \underline{+6x^3 + 12x^2} \phantom{+ 5x + 10} \\
 +15x^2 + 5x \phantom{+ 10} \\
 \underline{-15x^2 - 30x} \phantom{+ 10} \\
 +25x + 10 \\
 \underline{-25x + 50} \\
 +60^* \\
 \hline
 \rightarrow 2x^3 - 6x^2 + 15x - 25 + \frac{60}{x + 2}
 \end{array}$$

6: ¿Cuál es el volumen de un cubo de arista  $x+z$ ?

$$(x+z)^3$$

$$(a+b)^3 = (a)^3 + 3ab(a+b) + (b)^3$$

$$(x)^3 + 3(z)(x) + (z)^3$$

$$x^3 + 6xz + z^3$$

7: ¿Cuál es el volumen de un cilindro cuyo diámetro es de  $2x+6$  y su altura por la expresión  $3x+1$ ?

$$8: (-abc)^5 = -5abc$$

$$9: (2x^2yz^3)^3 = 6x^2 - 3yz^3$$

$$10: (a-2)^2 = 2a - 4$$