

## Exercice 2

(1) C. E. :

$$\begin{aligned}
 y^2 - 1 \neq 0 &\Leftrightarrow (y - 1)(y + 1) \neq 0 \\
 &\Leftrightarrow y - 1 \neq 0 \text{ et } y + 1 \neq 0 \\
 &\Leftrightarrow y \neq 1 \text{ et } y \neq -1
 \end{aligned}$$

Alors on a :

$$\frac{-y^2 + 2y - 1}{y^2 - 1} = -\frac{(y^2 - 2y + 1)}{(y - 1)(y + 1)} = -\frac{(y - 1)^2}{\cancel{(y - 1)}(y + 1)} = -\frac{y - 1}{y + 1}$$

(2) C. E. :

$$\begin{aligned}
 (a - 2)^3 \neq 0 &\Leftrightarrow a - 2 \neq 0 \\
 &\Leftrightarrow a \neq 2
 \end{aligned}$$

Alors on a :

$$\frac{(a^2 - 2a)(5a - 10)}{(a - 2)^3} = \frac{a\cancel{(a - 2)} \cdot 5 \cdot \cancel{(a - 2)}}{(a - 2)^3} = \frac{5a}{a - 2}$$

## Exercice 3

$$\begin{aligned}
 (1) \quad &\frac{a - b}{a + b} - \frac{3a}{b} - \frac{b}{a - b} \\
 &= \frac{b(a - b)^2 - 3a(a - b)(a + b) - b^2(a + b)}{b(a + b)(a - b)} \\
 &= \frac{b(a^2 - 2ab + b^2) - 3a(a^2 - b^2) - b^2(a + b)}{b(a + b)(a - b)} \\
 &= \frac{\cancel{a^2b} - \cancel{2ab^2} + \cancel{b^3} - 3a^3 + \cancel{3ab^2} - \cancel{ab^2} - \cancel{b^3}}{b(a + b)(a - b)} \\
 &= \frac{a^2b - 3a^3}{b(a + b)(a - b)} \\
 &= \frac{a^2(b - 3a)}{b(a + b)(a - b)}
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad &\frac{x^2 - 36y^2}{12z^2 - 18z} \cdot \frac{2z - 3}{6y - x} \\
 &= \frac{\cancel{(x - 6y)}(x + 6y)\cancel{(2z - 3)}}{-6z\cancel{(2z - 3)}\cancel{(x - 6y)}} \\
 &= \frac{x + 6y}{-6z}
 \end{aligned}$$

$$\begin{aligned}
(3) \quad & \frac{a - \frac{1}{a-1} - 1}{a^2 - 4a + 4} : \frac{1}{a^2 - 1} \\
&= \frac{\frac{a(a-1)}{a-1} - \frac{1}{a-1} - \frac{a-1}{a-1}}{(a-2)^2} : \frac{1}{(a-1)(a+1)} \\
&= \frac{\frac{a(a-1) - 1 - a + 1}{a-1}}{(a-2)^2} \cdot \frac{(a-1)(a+1)}{1} \\
&= \frac{a^2 - 2a}{(a-2)^2} \cdot \frac{(a-1)(a+1)}{1} \\
&= \frac{a^2 - 2a}{a-1} \cdot \frac{1}{(a-2)^2} \cdot \frac{(a-1)(a+1)}{1} \\
&= \frac{\cancel{a(a-2)}}{\cancel{a-1}} \cdot \frac{1}{(a-2)^2} \cdot \frac{\cancel{(a-1)}(a+1)}{1} \\
&= \frac{a(a+1)}{a-2}
\end{aligned}$$

#### Exercise 4

$$\begin{aligned}
(1) \quad & \frac{3}{\sqrt{2}} - \frac{\sqrt{8}}{5} + \frac{\sqrt{18}}{7} = \frac{3\sqrt{2}}{2} - \frac{2\sqrt{2}}{5} + \frac{3\sqrt{2}}{7} \\
&= \frac{105\sqrt{2} - 28\sqrt{2} + 30\sqrt{2}}{70} \\
&= \frac{107\sqrt{2}}{70}
\end{aligned}$$

$$\begin{aligned}
(2) \quad & \frac{4\sqrt{2}(\sqrt{3}+2)}{(\sqrt{3}-2)(\sqrt{3}+2)} - \frac{\sqrt{6}(\sqrt{3}-2)}{(\sqrt{3}+2)(\sqrt{3}-2)} \\
&= \frac{4\sqrt{6} + 8\sqrt{2}}{3-4} - \frac{3\sqrt{2} - 2\sqrt{6}}{3-4} \\
&= \frac{4\sqrt{6} + 8\sqrt{2}}{-1} - \frac{3\sqrt{2} - 2\sqrt{6}}{-1} \\
&= -4\sqrt{6} - 8\sqrt{2} + 3\sqrt{2} - 2\sqrt{6} \\
&= -6\sqrt{6} - 5\sqrt{2}
\end{aligned}$$

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