A.

1. $(x^3 - 9x) + (45 - 5x^2)$

$[(x \cdot (x^2 - 9)] + (45 - 5x^2)$

$(x \cdot (x^2 - 9)) + (5(9 - x^2))$

$(x \cdot (x - 3) \cdot (x + 3)) + (5(9 - x^2))$

$(x \cdot (x - 3) \cdot (x + 3)) + (5(3 - x) \cdot (3 + x))$

$x \cdot (x - 3) \cdot (x + 3) + 5(3 - x) \cdot (3 + x)$

$x \cdot (x - 3) \cdot (x + 3) + 5 \cdot (-(x - 3)) \cdot (3 + x)$

$x \cdot (x - 3) \cdot (x + 3) - 5(x - 3) \cdot (3 + x)$

$(x - 3) \cdot (x + 3) \cdot (x - 5)$

2. $64x^4 y^2 - 27 x y^5$

$\quad x y^2 \cdot (64 x^3 - 27 y^3)$

$\quad x y^2 \cdot (4x - 3y) \cdot (16 x^2 + 12 x y + 9 y^2)$

B.

1. $\left(x - \dfrac{3}{x-2}\right)\left(\dfrac{9}{x^2-9} - 1\right)$

$$\dfrac{x \cdot (x-2) - 3}{x-2} \cdot \dfrac{9 - (x^2-9)}{x^2-9}$$

$$\dfrac{x^2 - 2x - 3}{x-2} \cdot \dfrac{9 - x^2 + 9}{x^2-9}$$

$$\dfrac{x^2 - 2x - 3}{x-2} \cdot \dfrac{9 - x^2 + 9}{(x-3)\cdot(x+3)}$$

$$\dfrac{x^2 + x - 3x - 3}{x-2} \cdot \dfrac{18 - x^2}{(x-3)\cdot(x-3)}$$

$$\dfrac{x \cdot (x+1) - 3(x+1)}{x-2} \cdot \dfrac{18 - x^2}{(x-3)\cdot(x+3)}$$

$$\dfrac{(x+1)\cdot(x-3)}{x-2} \cdot \dfrac{18 - x^2}{(x-3)\cdot(x+3)}$$

$$\dfrac{x+1}{x-2} \cdot \dfrac{18 - x^2}{x+3}$$

$$\dfrac{(x+1)\cdot(18-x^2)}{(x-2)\cdot(x+3)}$$

$$\dfrac{18x - x^3 + 18 - x^2}{x^2 + 3x - 2x - 6}$$

$$\dfrac{-x^3 - x^2 + 18x + 18}{x^2 + x - 6}$$

4. $\dfrac{4-x}{\sqrt{2x+5}-3\sqrt{x}}$

$\dfrac{4-x}{\sqrt{2x+5}-3\sqrt{x}} \cdot \dfrac{\sqrt{2x+5}+3\sqrt{x}}{\sqrt{2x+5}+3\sqrt{x}}$

$\dfrac{(4-x)\cdot(\sqrt{2x+5}+3\sqrt{x})}{(\sqrt{2x+5}-3\sqrt{x})\cdot(\sqrt{2x+5}+3\sqrt{x})}$

$\dfrac{4\sqrt{2x+5}+12\sqrt{x}-x\sqrt{2x+5}-3x\sqrt{x}}{2x+5-9x}$

$\dfrac{4\sqrt{2x+5}+12\sqrt{x}-x\sqrt{2x+5}-3x\sqrt{x}}{(-7x+5)}$

D.

7) $\dfrac{3}{x} + \dfrac{5}{x+2} = 2$

$\dfrac{3(x+2) + 5x - 2x \cdot (x+2)}{x \cdot (x+2)} = 0$

$\dfrac{3x + 6 + 5x - 2x^2 - 4x}{x \cdot (x+2)} = 0$

$\dfrac{4x + 6 - 2x^2}{x \cdot (4+2)} = 0$

$4x + 6 - 2x^2 = 0$

$-2x^2 + 4x + 6 = 0$

$x^2 + x - 3x - 3 = 0$

$x \cdot (x+1) - 3(x+1) = 0$

$x + 1 = 0$
$x - 3 = 0$

$x = -1$
$x - 3 = 0 = x = 3$

$x_1 = -1 , \quad x_2 = 3$

$S = \{-1,3\}$

8. $x^4 - 3x^2 + 2 = 0$

$T^2 - 3T + 2 = 0$

$T = 1 \quad x^2 = 1$
$T = 2 \quad x^2 = 2$

$x = -1$
$x = 1$
$x^2 = 2$

$x = -\sqrt{2}$
$x = \sqrt{2}$

$x_1 = -\sqrt{2}, \quad x_2 = -1, \quad x_3 = 1, \quad x_4 = \sqrt{2}$

$S = \{\cdots\}$

9) $2x^2 - 14x + 1 = 0$

$2x^2 - 14x = -1$

$x^2 - 7x = -\frac{1}{2}$

$x^2 - 7x + \left(\frac{7}{2}\right)^2 = -\frac{1}{2} + \left(\frac{7}{2}\right)^2$

$\left(x - \frac{7}{2}\right)^2 = \frac{47}{4}$

$x = \frac{\pm\sqrt{47} + 7}{2}$

$x = \frac{\sqrt{47} + 7}{2}$

$x_1 = \frac{-\sqrt{47} + 7}{2}, \quad x_2 = \frac{\sqrt{47} + 7}{2}$

$S = \{\cdot, \cdot\}$