EXERCICE 1 — 2 points

$A = 3x^2 + 4x^2 + 3x - 5x - 2 + 1 = 7x^2 - 2x - 1$
$B = -3x^3 + 5x^3 - 4x^2 - 2x^2 - 2x + 5x + 1 - 4 = 2x^3 - 6x^2 + 3x - 3$
$C = x + x + 2x - y - 2y - y + z - z = 4x - 4y$
$D = 3x - 3y - 4y + 4x + x - y = 8x - 8y$

EXERCICE 2 — 6 points

$A = 8x + 14 + 10x - 45 = 18x - 31$
$B = 18x^2 - 30x - 2x + 5x^2 = 23x^2 - 32x$
$C = 42x - 35x^2 + 54 - 45x = -35x^2 - 3x + 54$
$D = 6x^2 - 4x - 15x + 10 = 6x^2 - 19x + 10$
$E = 7 - (x - 4x^2 - 7 + 28x) = 7 - x + 4x^2 + 7 - 28x = 4x^2 - 29x + 14$
$F = (81x^2 - 90x + 25) - 9(9x^2 - 30x + 25) = 81x^2 - 90x + 25 - 81x^2 + 270x - 225 = 180x - 200$

EXERCICE 3 — 3 points

1.
$$\begin{array}{r} 59,87 \\ +3584,10 \\ \hline 3643,97 \end{array}$$

2.
$$\begin{array}{r} 78,521 \\ -38,732 \\ \hline 39,789 \end{array}$$

3.
$$\begin{array}{r} 83,7 \\ \times\ 6,9 \\ \hline 7533 \\ +\ 50220 \\ \hline 577,53 \end{array}$$

EXERCICE 4 — 6 points

$A = 5(5x - 7)$ $B = 9x(2 - 3x)$ $C = 7xy(2yz + 3z^2 - 9x)$ $D = (5 - 2x)(7x + 10)$
$E = (4 - 6x)[(3x - 8) - (2 + 5x)] = (4 - 6x)(3x - 8 - 2 - 5x) = (4 - 6x)(-2x - 10) = -2(4 - 6x)(x + 5)$

EXERCICE 5 — 5 points

1. **a.** $\dfrac{56}{11} + \dfrac{20}{22} = \dfrac{112}{22} + \dfrac{20}{22} = \dfrac{132}{22} = 6$

b. $\dfrac{15}{16} \div \dfrac{30}{32} = \dfrac{15}{16} \times \dfrac{32}{30} = \dfrac{15 \times 2 \times 16}{16 \times 2 \times 15} = 1$

2. **a.** $\dfrac{35}{36} \times \dfrac{27}{21} \times \dfrac{42}{14} = \dfrac{7 \times 5 \times 9 \times 3 \times 2 \times 21}{9 \times 4 \times 21 \times 2 \times 7} = \dfrac{15}{4}$

b. $\dfrac{\frac{4}{6} + \frac{7}{2}}{\frac{21}{4} - \frac{12}{16}} = \dfrac{\frac{4}{6} + \frac{21}{6}}{\frac{21}{4} - \frac{3}{4}} = \dfrac{\frac{25}{6}}{\frac{18}{4}} = \dfrac{25}{6} \times \dfrac{4}{18} = \dfrac{25 \times 2 \times 2}{2 \times 3 \times 9 \times 2} = \dfrac{25}{27}$

EXERCICE 6 - BONUS **2 points**

$A = 3x^2 + 5xy + 2y^2 = 3x^2 + 3xy + 2xy + 2y^2 = 3x(x+y) + 2y(x+y)$
$A = (x+y)(3x+2y)$

$$
\begin{aligned}
B &= 1 + \cfrac{2}{3 + \cfrac{2}{3 - \cfrac{2}{1 - \frac{1}{2}}}} \\
&= 1 + \cfrac{2}{3 + \cfrac{2}{3 - \cfrac{2}{\frac{1}{2}}}} \\
&= 1 + \cfrac{2}{3 + \cfrac{2}{3-4}} \\
&= 1 + \cfrac{2}{3 + \frac{2}{-1}} \\
&= 1 + \frac{2}{3-2} \\
&= 1 + \frac{2}{1} \\
&= 1 + 2 \\
B &= 3
\end{aligned}
$$