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$$\begin{aligned}(1) (x+3)(x-5) + (x+4)^2 \\ &= x^2 - 2x - 15 + x^2 + 8x + 16 \\ &= 2x^2 + 6x + 1\end{aligned}$$

$$\begin{aligned}(3) (x+2)(x+6) + (x-1)^2 \\ &= x^2 + 8x + 12 + x^2 - 2x + 1 \\ &= 2x^2 + 6x + 13\end{aligned}$$

$$\begin{aligned}(5) (a+8)^2 + (a+3)(a-3) \\ &= a^2 + 16a + 64 + a^2 - 9 \\ &= 2a^2 + 16a + 55\end{aligned}$$

$$\begin{aligned}(7) (x+9)^2 + (x-4)^2 \\ &= x^2 + 18x + 81 + x^2 - 8x + 16 \\ &= 2x^2 + 10x + 97\end{aligned}$$

$$\begin{aligned}(9) (a+4)(a-2) - (a+3)^2 \\ &= a^2 + 2a - 8 - (a^2 + 6a + 9) \\ &= a^2 + 2a - 8 - a^2 - 6a - 9 \\ &= -4a - 17\end{aligned}$$

$$\begin{aligned}(2) (a-3)(a-6) - 2a(5-a) \\ &= a^2 - 9a + 18 - 10a + 2a^2 \\ &= 3a^2 - 19a + 18\end{aligned}$$

$$\begin{aligned}(4) (x+7)(x-3) - (x+4)(x-4) \\ &= x^2 + 4x - 21 - (x^2 - 16) \\ &= x^2 + 4x - 21 - x^2 + 16 \\ &= 4x - 5\end{aligned}$$

$$\begin{aligned}(6) (a-6)(a+6) - (a-2)(a-5) \\ &= a^2 - 36 - (a^2 - 7a + 10) \\ &= a^2 - 36 - a^2 + 7a - 10 \\ &= 7a - 46\end{aligned}$$

$$\begin{aligned}(8) (x-8)(x+3) - (x+2)(x-7) \\ &= x^2 - 5x - 24 - (x^2 - 5x - 14) \\ &= x^2 - 5x - 24 - x^2 + 5x + 14 \\ &= -10\end{aligned}$$

$$\begin{aligned}(10) (x+5)^2 - (x+3)(x-3) \\ &= x^2 + 10x + 25 - (x^2 - 9) \\ &= x^2 + 10x + 25 - x^2 + 9 \\ &= 10x + 34\end{aligned}$$

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$$\begin{aligned}
 (1) \quad & 2(a+2)^2 + (a+3)(a-1) \\
 &= 2(\overbrace{a^2+4a+4}) + a^2+2a-3 \\
 &= 2a^2+8a+8 + a^2+2a-3 \\
 &= 3a^2+10a+5
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad & (2a+5)(2a-5) - 4(a-3)^2 \\
 &= 4a^2-25 - 4(\overbrace{a^2-6a+9}) \\
 &= 4a^2-25 - 4a^2+24a-36 \\
 &= 24a-61
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad & 8(x-y)(x+2y) - (x+4y)^2 \\
 &= 8(\overbrace{x^2+2xy-2y^2}) - (\overbrace{x^2+8xy+16y^2}) \\
 &= 8x^2+8xy-16y^2 - x^2-8xy-16y^2 \\
 &= 7x^2-32y^2
 \end{aligned}$$

$$\begin{aligned}
 (4) \quad & (3x+y)^2 - (2x+y)(2x-3y) \\
 &= 9x^2+6xy+y^2 - (\overbrace{4x^2-4xy-3y^2}) \\
 &= 9x^2+6xy+y^2 - 4x^2+4xy+3y^2 \\
 &= 5x^2+10xy+4y^2
 \end{aligned}$$

$$\begin{aligned}
 (5) \quad & (3x-8y)(3x+4y) + (x+6y)^2 \\
 &= 9x^2-12xy-32y^2 + x^2+12xy+36y^2 \\
 &= 10x^2+4y^2
 \end{aligned}$$

$$\begin{aligned}
 (6) \quad & 4(x+9)(x-2) - 3(x-4)(x+6) \\
 &= 4(\overbrace{x^2+7x-18}) - 3(\overbrace{x^2+2x-24}) \\
 &= 4x^2+28x-72 - 3x^2-6x+72 \\
 &= x^2+22x
 \end{aligned}$$

$$\begin{aligned}
 (7) \quad & 5(m+3)(m-3) - (3m+1)(3m-4) \\
 &= 5(\overbrace{m^2-9}) - (\overbrace{9m^2-9m-4}) \\
 &= 5m^2-45 - 9m^2+9m+4 \\
 &= -4m^2+9m-41
 \end{aligned}$$

$$\begin{aligned}
 (8) \quad & (5x-2)^2 - 4(x-1)(x+1) \\
 &= 25x^2-20x+4 - 4(\overbrace{x^2-1}) \\
 &= 25x^2-20x+4 - 4x^2+4 \\
 &= 21x^2-20x+8
 \end{aligned}$$

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$$\begin{aligned}(1) & (x + \frac{3}{2})^2 - (x - \frac{1}{2})^2 \\ & = x^2 + 3x + \frac{9}{4} - (x^2 - x + \frac{1}{4}) \\ & = x^2 + 3x + \frac{9}{4} - x^2 + x - \frac{1}{4} \\ & = 4x + \frac{8}{4} \\ & = 4x + 2\end{aligned}$$

$$\begin{aligned}(3) & (2a + \frac{b}{4})^2 - (2a - \frac{b}{4})^2 \\ & = 4a^2 + ab + \frac{b^2}{16} - (4a^2 - ab + \frac{b^2}{16}) \\ & = 4a^2 + ab + \frac{b^2}{16} - 4a^2 + ab - \frac{b^2}{16} \\ & = 2ab\end{aligned}$$

$$\begin{aligned}(5) & (x+5)(x-14) + (x+6)^2 - (x-8)(x+8) \\ & = x^2 - 9x - 70 + x^2 + 12x + 36 - (x^2 - 64) \\ & = 2x^2 + 3x - 34 - x^2 + 64 \\ & = x^2 + 3x + 30\end{aligned}$$

$$\begin{aligned}(2) & (x - \frac{1}{3})^2 - (x + \frac{1}{2})^2 \\ & = x^2 - \frac{2}{3}x + \frac{1}{9} - (x^2 + x + \frac{1}{4}) \\ & = x^2 - \frac{2}{3}x + \frac{1}{9} - x^2 - x - \frac{1}{4} \\ & = -\frac{2}{3}x - \frac{3}{3}x + \frac{4}{36} - \frac{9}{36} \\ & = -\frac{5}{3}x - \frac{5}{36}\end{aligned}$$

$$\begin{aligned}(4) & 2(3x-3)(3x+4) - 8(x - \frac{1}{2})^2 \\ & = 2(9x^2 + 3x - 12) - 8(x^2 - x + \frac{1}{4}) \\ & = 18x^2 + 6x - 24 - 8x^2 + 8x - 2 \\ & = 10x^2 + 14x - 26\end{aligned}$$

$$\begin{aligned}
 & \boxed{32} \quad \left( \frac{x+y-7}{A} \right) \left( \frac{x+y+1}{A} \right) \\
 & = (A-7)(A+1) \\
 & = A^2 - 6A - 7 \\
 & = (x+y)^2 - 6(x+y) - 7 \\
 & = x^2 + 2xy + y^2 - 6x - 6y - 7
 \end{aligned}$$

$$\begin{aligned}
 & (2) \quad \left( \frac{a-b-5}{A} \right) \left( \frac{a-b-8}{A} \right) \\
 & = (A-5)(A-8) \\
 & = A^2 - 13A + 40 \\
 & = (a-b)^2 - 13(a-b) + 40 \\
 & = a^2 - 2ab + b^2 - 13a + 13b + 40
 \end{aligned}$$

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

$$\begin{aligned}
 & (4) \quad \left( \frac{x-y+4}{A} \right)^2 \\
 & = (A+4)^2 \\
 & = A^2 + 8A + 16 \\
 & = (x-y)^2 + 8(x-y) + 16 \\
 & = x^2 - 2xy + y^2 + 8x - 8y + 16
 \end{aligned}$$

$$\begin{aligned}
 & (5) \quad \left( \frac{2x+y-4}{A} \right)^2 \\
 & = (A-4)^2 \\
 & = A^2 - 8A + 16 \\
 & = (2x+y)^2 - 8(2x+y) + 16 \\
 & = 4x^2 - 4xy + y^2 - 16x - 8y + 16
 \end{aligned}$$

$$\begin{aligned}
 & (6) \quad \left( \frac{m-2n-7}{A} \right)^2 \\
 & = (A-7)^2 \\
 & = A^2 - 14A + 49 \\
 & = (m-2n)^2 - 14(m-2n) + 49 \\
 & = m^2 - 4mn + 4n^2 - 14m + 28n + 49
 \end{aligned}$$

$$\begin{aligned}
 & (7) \quad \left( \frac{a+b+3}{A} \right) \left( \frac{a+b-3}{A} \right) \\
 & = (A+3)(A-3) \\
 & = A^2 - 9 \\
 & = (a+b)^2 - 9 \\
 & = a^2 + 2ab + b^2 - 9
 \end{aligned}$$

$$\begin{aligned}
 & (8) \quad \left( \frac{x-y-9}{A} \right) \left( \frac{x-y+9}{A} \right) \\
 & = (A-9)(A+9) \\
 & = A^2 - 81 \\
 & = (x-y)^2 - 81 \\
 & = x^2 - 2xy + y^2 - 81
 \end{aligned}$$

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$$(9) \frac{(3x+y+5)}{A} \frac{(3x+y-2)}{A}$$

$$= (A+5)(A-2)$$

$$= A^2 + 3A - 10$$

$$= (3x+y)^2 + 3(3x+y) - 10$$

$$= 9x^2 + 6xy + y^2 + 9x + 3y - 10$$

$$(10) \frac{(2m-n-6)}{A} \frac{(2m-n+6)}{A}$$

$$= (A-6)(A+6)$$

$$= A^2 - 36$$

$$= (2m-n)^2 - 36$$

$$= 4m^2 - 4mn + n^2 - 36$$