



Math Olympiad and Problem Solving Programs  
E120 - Honors Algebra Problem Solving  
Problem Set 18.1 - Factorization by Grouping

Name:

Date:

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**Instruction:** Factorize the following by grouping. Show your work.

1.  $(a - b)(c + d)$

2.  $(a - x)(x + y)$

3.  $(4 - q)(q + p)$

4.  $a^2b + a^2c + 4c + 4b = a^2(b + c) + 4(c + b) = (a^2 + 4)(b + c)$

5.  $10x + 10y - dy - dx = 10(x + y) - d(y + x) = (10 - d)(x + y)$

6.  $e^2 - e - p^2 + p^2e = e(e - 1) + p^2(-1 + e) = (e + p^2)(e - 1)$

7.  $(4 - m)(a - b)$

8.  $4ax - 2ay - 6bx + 3by = 2a(2x - y) - 3b(2x - y) = (2a - 3b)(2x - y)$

9.  $(8m - a)(b + 3n)$

10.  $a(2a^2 + 1)(2a + 3)$