

Factoring By Grouping HOMEWORK- Day 1

Factor each by grouping.

1. $(12a^3 - 9a^2) + (4a - 3)$
 $3a^2(4a - 3) + 1(4a - 3)$

$$\boxed{(3a^2 + 1)(4a - 3)}$$

2. $(2p^3 + 5p^2) + (6p + 15)$
 $p^2(2p + 5) + 3(2p + 5)$

$$\boxed{(p^2 + 3)(2p + 5)}$$

3. $(3n^3 - 4n^2) + (9n - 12)$
 $n^2(3n - 4) + 3(3n - 4)$

$$\boxed{(n^2 + 3)(3n - 4)}$$

4. $(12n^3 + 4n^2) + (3n + 1)$
 $4n^2(3n + 1) + 1(3n + 1)$

$$\boxed{(4n^2 + 1)(3n + 1)}$$

5. $(m^3 - m^2) + (2m - 2)$
 $m^2(m - 1) + 2(m - 1)$

$$\boxed{(m^2 + 2)(m - 1)}$$

6. $(5n^3 - 10n^2) + (3n - 6)$
 $5n^2(n - 2) + 3(n - 2)$

$$\boxed{(5n^2 + 3)(n - 2)}$$

7. $(35xy - 5x) - (56y + 8)$
 $5x(7y - 1) - 8(7y - 1)$

$$\boxed{(5x - 8)(7y - 1)}$$

8. $(35ab - 15a^2) + (42b - 18a)$
 $5a(7b - 3a) + 6(7b - 3a)$

$$\boxed{(5a + 6)(7b - 3a)}$$

Factor each completely by first factoring out a GCF.

9. $36xy - 126xp + 30yz - 105pz$

$$3[12xy - 42xp + 10yz - 35pz]$$

$$3[6x(2y-7p) + 5z(2y-7p)]$$

$$\boxed{3(6x+5z)(2y-7p)}$$

11. $-32ph + 8pk - 48qh + 12qk$

$$-4[8ph - 2pk + 12qh - 3qk]$$

$$-4[2p(4h-k) + 3q(4h-k)]$$

$$\boxed{-4(2p+3q)(4h-k)}$$

or

$$4[-8ph + 2pk - 12qh + 3qk]$$

$$4[2p(-4h+k) + 3q(-4h+k)]$$

$$\boxed{4(2p+3q)(-4h+k)}$$

or

$$\boxed{4(-2p-3q)(4h-k)}$$

10. $105xa + 140xb - 30ay - 40yb$

$$5[21xa + 28xb - 6ay - 8yb]$$

$$5[7x(3a+4b) - 2y(3a+4b)]$$

$$5(7x-2y)(3a+4b)$$

12. $-16bd + 18be + 48cd - 54ce$

$$-2(8bd - 9be - 24cd + 27ce)$$

$$-2[b(8d-9e) - 3c(8d-9e)]$$

$$\boxed{-2(b-3c)(8d-9e)}$$

or

$$2[-8bd + 9be + 24cd - 27ce]$$

$$2[b(-8d+9e) - 3c(-8d+9e)]$$

$$\boxed{2(b-3c)(-8d+9e)}$$

or

$$\boxed{2(-b+3c)(8d-9e)}$$