

## Factoring By Grouping

**Factor each completely.**

1)  $8r^3 - 64r^2 + r - 8$

2)  $12p^3 - 21p^2 + 28p - 49$

3)  $12x^3 + 2x^2 - 30x - 5$

4)  $6v^3 - 16v^2 + 21v - 56$

5)  $63n^3 + 54n^2 - 105n - 90$

6)  $21k^3 - 84k^2 + 15k - 60$

7)  $25v^3 + 5v^2 + 30v + 6$

8)  $105n^3 + 175n^2 - 75n - 125$

9)  $96n^3 - 84n^2 + 112n - 98$

10)  $28v^3 + 16v^2 - 21v - 12$

11)  $4v^3 - 12v^2 - 5v + 15$

12)  $49x^3 - 35x^2 + 56x - 40$

13)  $24p^3 + 15p^2 - 56p - 35$

14)  $24r^3 - 64r^2 - 21r + 56$

$$15) 56xw + 49xk^2 - 24yw - 21yk^2$$

$$16) 42mc + 36md - 7n^2c - 6n^2d$$

$$17) 12x^2u + 3x^2v + 28yu + 7yv$$

$$18) 40ac^2 + 25ak^2 + 32bc^2 + 20bk^2$$

$$19) 12bc - 4bd - 15xc + 5xd$$

$$20) 16mn - 4m^2 + 28n - 7m$$

$$21) 56xy - 35x + 16ry - 10r$$

$$22) 21xy + 15x + 35ry + 25r$$

$$23) 5a^2z - 4a^2c + 15xz - 12xc$$

$$24) 4xy + 6 - x - 24y$$

$$25) 21xy - 12b^2 + 14xb - 18by$$

$$26) 9mz - 4nc + 3mc - 12nz$$

$$27) 28xy + 25 + 35x + 20y$$

$$28) 30uv + 30u + 36u^2 + 25v$$

## Factoring By Grouping

Factor each completely.

1)  $8r^3 - 64r^2 + r - 8$

$$(8r^2 + 1)(r - 8)$$

2)  $12p^3 - 21p^2 + 28p - 49$

$$(3p^2 + 7)(4p - 7)$$

3)  $12x^3 + 2x^2 - 30x - 5$

$$(2x^2 - 5)(6x + 1)$$

4)  $6v^3 - 16v^2 + 21v - 56$

$$(2v^2 + 7)(3v - 8)$$

5)  $63n^3 + 54n^2 - 105n - 90$

$$3(3n^2 - 5)(7n + 6)$$

6)  $21k^3 - 84k^2 + 15k - 60$

$$3(7k^2 + 5)(k - 4)$$

7)  $25v^3 + 5v^2 + 30v + 6$

$$(5v^2 + 6)(5v + 1)$$

8)  $105n^3 + 175n^2 - 75n - 125$

$$5(7n^2 - 5)(3n + 5)$$

9)  $96n^3 - 84n^2 + 112n - 98$

$$2(6n^2 + 7)(8n - 7)$$

10)  $28v^3 + 16v^2 - 21v - 12$

$$(4v^2 - 3)(7v + 4)$$

11)  $4v^3 - 12v^2 - 5v + 15$

$$(4v^2 - 5)(v - 3)$$

12)  $49x^3 - 35x^2 + 56x - 40$

$$(7x^2 + 8)(7x - 5)$$

13)  $24p^3 + 15p^2 - 56p - 35$

$$(3p^2 - 7)(8p + 5)$$

14)  $24r^3 - 64r^2 - 21r + 56$

$$(8r^2 - 7)(3r - 8)$$

$$15) 56xw + 49xk^2 - 24yw - 21yk^2$$
$$(7x - 3y)(8w + 7k^2)$$

$$16) 42mc + 36md - 7n^2c - 6n^2d$$
$$(6m - n^2)(7c + 6d)$$

$$17) 12x^2u + 3x^2v + 28yu + 7yv$$
$$(3x^2 + 7y)(4u + v)$$

$$18) 40ac^2 + 25ak^2 + 32bc^2 + 20bk^2$$
$$(5a + 4b)(8c^2 + 5k^2)$$

$$19) 12bc - 4bd - 15xc + 5xd$$
$$(4b - 5x)(3c - d)$$

$$20) 16mn - 4m^2 + 28n - 7m$$
$$(4m + 7)(4n - m)$$

$$21) 56xy - 35x + 16ry - 10r$$
$$(7x + 2r)(8y - 5)$$

$$22) 21xy + 15x + 35ry + 25r$$
$$(3x + 5r)(7y + 5)$$

$$23) 5a^2z - 4a^2c + 15xz - 12xc$$
$$(a^2 + 3x)(5z - 4c)$$

$$24) 4xy + 6 - x - 24y$$
$$(x - 6)(4y - 1)$$

$$25) 21xy - 12b^2 + 14xb - 18by$$
$$(7x - 6b)(3y + 2b)$$

$$26) 9mz - 4nc + 3mc - 12nz$$
$$(3m - 4n)(3z + c)$$

$$27) 28xy + 25 + 35x + 20y$$
$$(7x + 5)(4y + 5)$$

$$28) 30uv + 30u + 36u^2 + 25v$$
$$(6u + 5)(5v + 6u)$$