

Factoring by Grouping Bell Work

Factor the following polynomials by grouping.

1. $6x + 12y - 4x - 8y$

2. $4h + 4k - 9h - 9k$

3. $bx + by + cx + cy$

4. $3cx + 15cy + 4dx + 20dy$

5. $-7xm - 7xn - 11ym - 11yn$

6. $4hx - 4hy - x + y$

7. $-3cr - 3cs + 2dr + 2ds$

8. $-2ar - 2as - 3br - 3bs$

9. $3wa - 3wb - a + b$

10. $3cm + 3cn + dm + dn$

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Answer:

Factor the following polynomials by grouping.

$$\begin{aligned}1. & 6x + 12y - 4x - 8y \\&= (6x + 12y) + (-4x - 8y) \\&= 6(x + 2y) - 4(x + 2y) \\&= (6 - 4)(x + 2y) \\&= (2)(x + 2y)\end{aligned}$$

$$\begin{aligned}3. & bx + by + cx + cy \\&= (bx + by) + (cx + cy) \\&= b(x + y) + c(x + y) \\&= (b + c)(x + y)\end{aligned}$$

$$\begin{aligned}5. & -7xm - 7xn - 11ym - 11yn \\&= (-7xm - 7xn) + (-11ym - 11yn) \\&= -7x(m + n) - 11y(m + n) \\&= (-7x - 11y)(m + n)\end{aligned}$$

$$\begin{aligned}7. & -3cr - 3cs + 2dr + 2ds \\&= (-3cr - 3cs) + (2dr + 2ds) \\&= -3c(r + s) + 2d(r + s) \\&= (-3c + 2d)(r + s)\end{aligned}$$

$$\begin{aligned}9. & 3wa - 3wb - a + b \\&= (3wa - 3wb) + (-a + b) \\&= 3w(a - b) - (a - b) \\&= (3w - 1)(a - b)\end{aligned}$$

$$\begin{aligned}2. & 4h + 4k - 9h - 9k \\&= (4h + 4k) + (-9h - 9k) \\&= 4(h + k) - 9(h + k) \\&= (4 - 9)(h + k) \\&= (-5)(h + k)\end{aligned}$$

$$\begin{aligned}4. & 3cx + 15cy + 4dx + 20dy \\&= (3cx + 15cy) + (4dx + 20dy) \\&= 3c(x + 5y) + 4d(x + 5y) \\&= (3c + 4d)(x + 5y)\end{aligned}$$

$$\begin{aligned}6. & 4hx - 4hy - x + y \\&= (4hx - 4hy) + (-x + y) \\&= 4h(x - y) - (x - y) \\&= (4h - 1)(x - y)\end{aligned}$$

$$\begin{aligned}8. & -2ar - 2as - 3br - 3bs \\&= (-2ar - 2as) + (-3br - 3bs) \\&= -2a(r + s) - 3b(r + s) \\&= (-2a - 3b)(r + s)\end{aligned}$$

$$\begin{aligned}10. & 3cm + 3cn + dm + dn \\&= (3cm + 3cn) + (dm + dn) \\&= 3c(m + n) + d(m + n) \\&= (3c + d)(m + n)\end{aligned}$$