

## Polynomial Review Worksheet

**Part I:** Perform the operation and write the result in standard form.

1.  $(6x+5)-(8x+15)$

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

3.  $5x-[3x-(10x+8)]$

4.  $(-3x)(5x+2)$

5.  $2x\left(4-\frac{7}{8}x\right)$

6.  $(x+3)(x+4)$

7.  $(3x-5)(2x+1)$

8.  $(2x+3)^2$

9.  $(2x-5y)^2$

10.  $(x-2)^3$

**Part II:** Factor the polynomial completely.

1.  $2x^3-6x$

$$2x(x^2-3)$$

2.  $4x^3-6x^2+12x$

$$2x(2x^2-3x+6)$$

\*will not factor  
any more\*

3.  $x^2-49$

$$(x+7)(x-7)$$

4.  $32x^2-18$

$$2(16x^2-9)$$

$$2(4x+3)(4x-3)$$

5.  $x^2+10x+25$

$$(x+5)(x+5) = (x+5)^2$$

6.  $4x^2+4x+1$

$$x^2+4x+4$$

$$\left(x+\frac{2}{4}\right)\left(x+\frac{2}{4}\right) \Rightarrow \left(x+\frac{1}{2}\right)\left(x+\frac{1}{2}\right)$$

$$\Rightarrow (2x+1)^2$$

8.  $24+5x-x^2$

$$-x^2+5x+24$$

$$-1(x^2-5x-24) \Rightarrow -1(x-8)(x+3)$$

7.  $x^2+5x+6$

$$(x+2)(x+3)$$

9.  $3x^2-5x+2$

$$x^2-5x+6$$

$$\left(x-\frac{2}{3}\right)\left(x-\frac{3}{3}\right)$$

$$(3x-2)(x-1)$$

10.  $9x^2-12x+4$

$$x^2-12x+36$$

$$\left(x-\frac{6}{9}\right)\left(x-\frac{6}{9}\right) \Rightarrow$$

$$\left(x-\frac{2}{3}\right)\left(x-\frac{2}{3}\right)$$

$$(3x-2)(3x-2)$$

$$\begin{array}{c} 25 \\ \times \\ 5 \\ \hline 10 \end{array}$$

$$\begin{array}{c} 6 \\ \times \\ 5 \\ \hline 3 \end{array}$$

## Answers to Factoring the Sum or Difference of Cubes

- 1)  $(x + 2)(x^2 - 2x + 4)$
- 2)  $(a + 4)(a^2 - 4a + 16)$
- 3)  $(a + 6)(a^2 - 6a + 36)$
- 4)  $(3 + 2x)(9 - 6x + 4x^2)$
- 5)  $(a - 6)(a^2 + 6a + 36)$
- 6)  $(4x - 3)(16x^2 + 12x + 9)$
- 7)  $(3m - 5)(9m^2 + 15m + 25)$
- 8)  $(x - 4)(x^2 + 4x + 16)$
- 9)  $2(6 + 5m)(36 - 30m + 25m^2)$
- 10)  $3(3x + 4)(9x^2 - 12x + 16)$
- 11)  $4(5x + 4)(25x^2 - 20x + 16)$
- 12)  $3(3x + 2)(9x^2 - 6x + 4)$
- 13)  $4(6 - u)(36 + 6u + u^2)$
- 14)  $2(3x - 1)(9x^2 + 3x + 1)$
- 15)  $4(3 - x)(9 + 3x + x^2)$
- 16)  $3(5 - 3a)(25 + 15a + 9a^2)$
- 17)  $(5a + 4b)(25a^2 - 20ab + 16b^2)$
- 18)  $3(6x + y)(36x^2 - 6xy + y^2)$
- 19)  $(6a - 5b)(36a^2 + 30ab + 25b^2)$
- 20)  $(5x + 6y)(25x^2 - 30xy + 36y^2)$
- 21)  $4(2m + 5n)(4m^2 - 10mn + 25n^2)$
- 22)  $(4x - 3y)(16x^2 + 12xy + 9y^2)$
- 23)  $4(4x - 5y)(16x^2 + 20xy + 25y^2)$
- 24)  $2(m + 3n)(m^2 - 3mn + 9n^2)$

**Factoring By Grouping****Factor each completely.**

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

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

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

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

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

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

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

8)  $224az + 56ac - 84yz - 21yc$   
 $7(8a - 3y)(4z + c)$

9)  $mz - 5mh^2 - 5nz + 25nh^2$   
 $(m - 5n)(z - 5h^2)$

10)  $12xy - 28x - 15y + 35$   
 $(4x - 5)(3y - 7)$