Prime Polynomial:

Factored Completely:

Factoring Out the Greatest Common Factor

1. Factor out the greatest common factor from each polynomial
   a. $15r - 27$
   b. $9z^4 + 81z$
   c. $-3z^5w^2 - 18z^3w^4$
   d. $6x(a + b) - 4y(a + b)$

Factoring by Grouping

2. Factor each polynomial by grouping.
   a. $4x^3 + 2x^2 - 2x - 1$
   b. $8r^3 - 64r^2 + r - 8$
   c. $10ab - 6b + 35a - 21$
   d. $4x^6 + 36 - x^6y - 9y$

Factoring Trinomials

3. Factor each trinomial, if possible.
   a. $8h^2 - 2h - 21$
   c. $6p^2 - 7p - 5$
   b. $9y^2 - 18y + 8$
   d. $16y^3 + 24y^2 - 16y$

Factoring Perfect Square Trinomials

$$x^2 + 2xy + y^2 = (x + y)^2$$
$$x^2 - 2xy + y^2 = (x - y)^2$$

4. Factor each trinomial
   a. $16p^2 - 40p + 25$
   b. $16p^2 - 40pq + 25q^2$
   c. $9m^2n^2 + 12mn + 4$

Difference of Squares

$$x^2 - y^2 = (x + y)(x - y)$$

5. Factor each polynomial
   a. $16q^2 - 25$
   b. $4m^2 - 9$

c. $36z^2 - 81y^4$

d. $(a + 2b)^2 - 4c^2$

Factoring Sum or Difference of Cubes

$$x^3 - y^3 = (x - y)(x^2 + xy + y^2)$$

$$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$$

6. Factor each polynomial

a. $27 - r^3$

c. $(b + 3)^3 - 27$

b. $8m^3 - 27n^3$

d. $x^3 + 27$

Factoring by Substitution

7. Factor each polynomial

a. $10(2a - 1)^2 - 19(2a - 1) - 15$

b. $(2a - 1)^3 + 8$

c. $6z^4 - 13z^2 - 5$

d. $(2y - 1)^2 - 4(2y - 1) + 4$

Homework:

Pg. 43
13, 19, 21, 29-37, 49, 59, 63, 91, 95, 97

Most Difficult First:

Pg. 44
34, 81, 85, 110, 112