

FACTORING SPECIAL POLYNOMIAL FORMS

PART 1: Factoring Out Common Factors

1.) $2x^3 - 6x$

$2x(x^2 - 3)$

2.) $3x^3 - 6x^2 + 9x$

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

3.) $-6x^3 + 42x^2y$

$-6x^2(x - 7y)$

4.) $5xy^2 - 25x^2y$

$5xy(y - 5x)$

5.) $4x(x - 7) + 5(x - 7)$

$(x - 7)(4x + 5)$

6.) $(x - 6)^2 - 5(x - 6)$

$(x - 6)(x - 6 - 5)$

$(x - 6)(x - 11)$

PART 2: Factoring the Difference of Two Squares

7.) $9x^2 - 1$

$(3x + 1)(3x - 1)$

8.) $196x^2 - 144$

$(14x + 12)(14x - 12)$

9.) $150x^2 - 216$

$6(25x^2 - 36)$

$6(5x + 6)(5x - 6)$

10.) $24x^3 - 54x$

$6x(4x^2 - 9)$

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

11.) $9x^2 - 16y^2$

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

12.) $54x^2 - 6y^2$

$6(9x^2 - y^2)$

$6(3x + y)(3x - y)$

PART 3: Factoring Perfect Square Trinomials

13.) $x^2 + 6x + 9$

$(x + 3)^2$

14.) $25x^2 - 40x + 16$

$(5x - 4)^2$

15.) $3x^2 + 30x + 75$

$3(x^2 + 10x + 25)$

$3(x + 5)^2$

16.) $27x^2 + 18x + 3$

$3(9x^2 + 6x + 1)$

$3(3x + 1)^2$

17.) $64x^2 - 48xy + 9y^2$

$$(8x - 3y)^2$$

18.) $98x^2 - 56xy + 8y^2$

$$2(49x^2 - 28xy + 4y^2)$$

$$2(7x - 2y)^2$$

PART 4: Factoring the Sum or Difference of Two Cubes

19.) $x^3 + 1$

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

20.) $x^3 - 216$

$$(x-6)(x^2 + 6x + 36)$$

21.) $27x^3 - 8$

$$(3x-2)(9x^2 + 6x + 4)$$

22.) $8x^3 + 125$

$$(2x+5)(4x^2 - 10x + 25)$$

23.) $3x^3 + 192$

$$3(x^3 + 64)$$

$$3(x+4)(x^2 - 4x + 16)$$

24.) $250x^3 - 54$

$$2(125x^3 - 27)$$

$$2(5x-3)(25x^2 + 15x + 9)$$

PART 5: Mixed Practice – Factor each expression completely.

25.) $x^2 - 8x + 16$

$$(x-4)^2$$

26.) $2x^2 - 18$

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

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

27.) $x^3 - 27$

$$(x-3)(x^2 + 3x + 9)$$

28.) $7xy - 35x^2y$

$$7xy(1-5x)$$

29.) $9x^2 + 24x + 16$

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

30.) $125x^2 - 20y^2$

$$5(25x^2 - 4y^2)$$

$$5(5x-2y)(5x+2y)$$

31.) $2x^3 - 16$

$$2(x^3 - 8)$$

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

32.) $2x^2 - 20x + 50$

$$2(x^2 - 10x + 25)$$

$$2(x-5)^2$$