

Name: KEY

Read all directions and problems carefully! Show all appropriate work for credit

1. Find the Greatest Common Factor of each of the following. (12 pts.)

42 and 126

42 (+3)

a^6b^3c and a^2b^7

a^2b^3 (+3)

160 and 96

32 (+8)

$x^9y^4z^2$ and $x^4y^6z^9$

$x^4y^4z^2$ (+8)

2. Factor the following polynomials by removing the greatest common factor. (6 pts.)

$-35xy^4 + 21x^3y^3 - 28x^2y^2$

$7xy^2(-5y^2 + 3x^2y - 4x)$
 or $-7xy^2(5y^2 - 3x^2y + 4x)$ (+3)

$90a^3b^3c^3 - 75a^5bc^3$

$15a^3bc^3(6b^2 - 5a^2)$ (+3)

3. Factor the following polynomial by grouping. (8 pts.)

$8x^2 + 6xy + 20x + 15y$

$2x(4x + 3y) + 5(4x + 3y)$

$(4x + 3y)(2x + 5)$ (+4)

$3a^2 - 6ab - 2a + 4b$

$3a(a - 2b) - 2(a - 2b)$

$(a - 2b)(3a - 2)$ (+4)

4. Factor the following trinomials completely. (22 pts.)

$x^2 - 19x + 48$

$(x - 3)(x - 16)$ (+5)
 48 -19
 -3(-16)

$x^2 - 2xy - 63y^2$

$(x - 9y)(x + 7y)$ (+6)
 -63 -2
 -9(7)

4. (Cont.)

$$12b^2 + 11b - 15$$

$$12b^2 + 20b - 9b - 15$$

$$4b(3b+5) - 3(3b+5)$$

$$(3b+5)(4b-3)$$

+6

$$12(-15) = \frac{-180}{20(-9)} \quad 20(-9)$$

$$9t^2 + 24t + 16$$

$$9t^2 + 12t + 12t + 16$$

$$3t(3t+4) + 4(3t+4)$$

$$(3t+4)(3t+4)$$

OR

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

+5

$$9(16) = \frac{144}{12(12)} \quad \frac{24}{12+12}$$

5. Factor the following binomials completely. (16 pts.)

$$8n^2 - 25$$

$$8n^2 - 5^2 = (\text{BINO})(\text{BINO})$$

$$(8n-5)(8n+5)$$

+4

$$t^3 + 27$$

$$t^3 + 3^3 = (\text{BINO})(\text{TRINO})$$

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

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

+4

$$64x^3 - 125$$

$$4^3x^3 - 5^3$$

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

$$(4x-5)(16x^2 + 20x + 25)$$

+4

$$16a^4 - 81$$

$$4^2(a^2)^2 - 9^2$$

$$(4a^2-9)(4a^2+9)$$

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

+4

6. Factor the following polynomials completely. (36 pts.)

$$48x^4y - 3x^2y$$

$$3x^2y(16x^2 - 1)$$

$$3x^2y(4^2x^2 - 1^2)$$

$$3x^2y(4x-1)(4x+1)$$

+5

$$2a^2b + 24ab + 72b$$

$$2b(a^2 + 12a + 36)$$

$$2b(a+6)(a+6)$$

OR

$$2b(a+6)^2$$

+6

6. (Cont.)

$$6ab^2 + 150a$$

$$6a(b^2 + 25)$$

PRIME

+4

$$4x^3(3x-5) - 6x^2(3x-5)$$

$$2x^2(3x-5)[2x-3]$$

+6

$$9a^2b^2 + 3a^2b - 4a^2b^2$$

$$a^2b(9b+3-4b)$$

OR

$$a^2b(5b+3)$$

+3

$$3ax^2 - 6axy + 15a^2x - 30a^2y$$

$$3a[x^2 - 2xy + 5ax - 10ay]$$

$$3a[x(x-2y) + 5a(x-2y)]$$

$$3a(x-2y)(x+5a)$$

+6

$$81x^5y - 3x^2y$$

$$3x^2y(27x^3 - 1)$$

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

$$3x^2y(3x-1)(3^2x^2 + 3x(1) + 1^2)$$

$$3x^2y(3x-1)(9x^2 + 3x + 1)$$

+6