

Name _____

Accel Geom/Adv Alg

Date _____ Period _____

Module 2 FACTORING REVIEW

Factor completely.

1) $x^2 - 17x + 42$

$$\begin{array}{r} 42 \\ -14 \quad -3 \\ -17 \end{array}$$

$$(x-14)(x-3)$$

2) $81x^4 - 9$

$$9(9x^4 - 1)$$

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

3) $15x^2 + 2x - 8$

$$\begin{array}{r} -120 \\ 12 \quad -10 \\ 2 \end{array}$$

$$(5x^2 + 12x - 10x - 8)$$

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

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

4) $x^5 + 2x^3 - 3x$

$$\begin{array}{r} -3 \\ 3 \quad -1 \\ 2 \end{array}$$

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

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

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

5) $3x^4 - 42x^2 - 96$

$$\begin{array}{r} -32 \\ -16 \quad 2 \\ -14 \end{array}$$

$$3(x^4 - 14x^2 - 32)$$

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

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

6) $64x^8y^{14} - 121$

$$(8x^4y^7-11)(8x^4y^7+11)$$

7) $2x^2 - 8x - 90$

$$\begin{array}{r} -45 \\ -9 \quad 5 \\ -4 \end{array}$$

$$2(x^2 - 4x - 45)$$

$$2(x-9)(x+5)$$

8) $x^2 + 11x - 10$

$$\begin{array}{r} -10 \\ 11 \end{array}$$

$$\text{Prime}$$

$$9) x^{14} + 5x^7 - 24$$

$$(x^7 + 8)(x^7 - 3)$$

$$\begin{array}{r} -24 \\ 8 \times -3 \\ 5 \end{array}$$

$$10) -10x^4 - 85x^3 - 105x^2$$

$$-5x^2(2x^2 + 17x + 21)$$

$$(2x^2 + 14x) + (3x + 21)$$

$$2x(x+7) + 3(x+7)$$

$$-5x^2(2x+3)(x+7)$$

$$\begin{array}{r} 42 \\ 14 \times 3 \\ 17 \end{array}$$

$$11) 16x^{10} - 24x^5y^2 + 9y^4$$

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

$$12) 32x^5 + 14x^3 - 18x$$

$$2x(16x^4 + 7x^2 - 9)$$

$$(16x^4 + 16x^2) - (9x^2 + 9)$$

$$16x^2(x^2 + 1) - 9(x^2 + 1)$$

$$2x(16x^2 - 9)(x^2 + 1)$$

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

$$14) -4x^2 + 29x - 7$$

$$-(4x^2 - 29x + 7)$$

$$(4x^2 - 28x) - (x + 7)$$

$$4x(x-7) - 1(x-7)$$

$$-(4x-1)(x-7)$$

$$\begin{array}{r} 28 \\ -28 \times -1 \\ -29 \end{array}$$

$$13) 150x^9 - 24x$$

$$6x(25x^8 - 4)$$

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

$$15) 50x^2 - 80x + 32$$

$$2(25x^2 - 40x + 16)$$

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

$$16) -3x^5y^2 + 18x^4y^2 + 24x^3y^2$$

$$-3x^3y^2(x^2 - 6x - 8)$$

$$\begin{array}{r} -8 \\ -8 \times -6 \\ -6 \end{array}$$

$$17) 4x^4 - 40x^2 + 36$$

$$4(x^4 - 10x^2 + 9)$$

$$4(x^2 - 9)(x^2 - 1)$$

$$4(x+3)(x-3)(x+1)(x-1)$$

$$18) -24x^2 + 20x + 84$$

$$-4(6x^2 - 5x - 21)$$

$$(6x^2 - 14x) + (9x - 21)$$

$$2x(3x-7) + 3(3x-7)$$

$$-4(2x+3)(3x-7)$$

$$\begin{array}{r} -126 \\ -14 \times 9 \\ -5 \end{array}$$

$$19) 20x^5 - 145x^3 + 225x$$

$$5x(4x^4 - 29x^2 + 45)$$

$$\begin{array}{r} 180 \\ -20 \quad -9 \\ -29 \end{array}$$

$$(4x^4 - 20x^2)(-9x^2 + 45)$$

$$4x^2(x^2 - 5) - 9(x^2 - 5)$$

$$(4x^2 - 9)(x^2 - 5)$$

$$21) 12x^2 - 3 \quad \boxed{5x(2x+3)(2x-3)(x^2-5)}$$

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

$$\boxed{3(3x+1)(3x-1)}$$

$$23) -x^{14} + 2x^7 + 3$$

$$-(x^{14} - 2x^7 - 3)$$

$$\begin{array}{r} -3 \\ -3 \quad -2 \\ -1 \end{array}$$

$$\boxed{-(x^7 - 3)(x^7 + 1)}$$

$$25) 12x^5 - 15x^3 - 27x$$

$$3x(4x^4 - 5x^2 - 9)$$

$$\begin{array}{r} -36 \\ -9 \quad 4 \\ -5 \end{array}$$

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

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

$$3x(x^2 + 1)(4x^2 - 9)$$

$$\boxed{3x(x^2 + 1)(2x + 3)(2x - 3)}$$

$$27) 16x^4 - 1$$

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

$$\boxed{(4x^2 + 1)(2x + 1)(2x - 1)}$$

$$29) 144x^2 - 25y^6z^{16}$$

$$\boxed{(12x + 5y^3z^8)(12x - 5y^3z^8)}$$

$$20) 28x^2 - 203x - 168$$

$$7(4x^2 - 29x - 24)$$

$$\begin{array}{r} -96 \\ -32 \quad 3 \\ -29 \end{array}$$

$$(4x^2 - 32x) + (3x - 24)$$

$$4x(x - 8) + 3(x - 8)$$

$$\boxed{7(4x + 3)(x - 8)}$$

$$22) 12x^2 - 71x - 25$$

$$(12x^2 - 75x) + (4x - 25)$$

$$\begin{array}{r} 300 \\ -75 \quad 4 \\ -71 \end{array}$$

$$3x(4x - 25) + 1(4x - 25)$$

$$\boxed{(3x + 1)(4x - 25)}$$

$$24) 16x^4 - 625$$

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

$$\boxed{(4x^2 + 25)(2x + 5)(2x - 5)}$$

$$26) x^2 - 22x + 105$$

$$\boxed{(x - 7)(x - 15)}$$

$$\begin{array}{r} 105 \\ -7 \quad -15 \\ -22 \end{array}$$

$$28) -6x^6 + 3x^5 + 45x^4$$

$$-3x^4(2x^2 - x - 15)$$

$$\begin{array}{r} -30 \\ -6 \quad 5 \\ -1 \end{array}$$

$$(2x^2 - 6x) + (5x - 15)$$

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

$$\boxed{-3x^4(2x + 5)(x - 3)}$$

$$30) x^2 + 21x + 80$$

$$\boxed{(x + 16)(x + 5)}$$

$$\begin{array}{r} 80 \\ 16 \quad 5 \\ 21 \end{array}$$