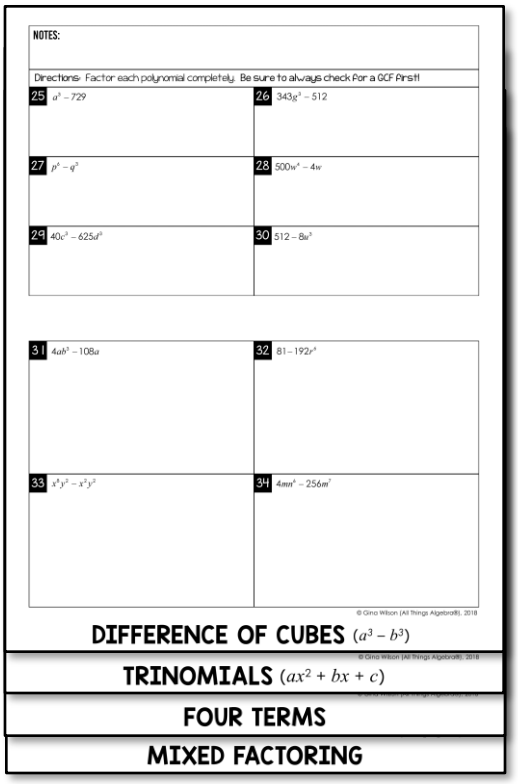
FACTORING POLYNOMIALS
Flip Book

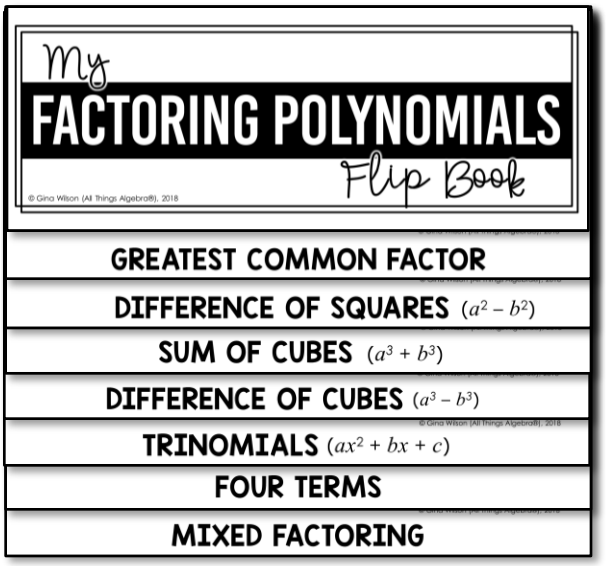
Objective: This flip book was created to use as a review of factoring by GCF, difference of squares, sum and difference of cubes, trinomials, four terms, and mixed factoring. Within each section, there are problems that require factoring completely. In total there are 70 review problems included in the book.

PC Printing Directions:
1) Click **File-> Print**
2) Choose **Pages 3-10**
3) Click **"Print on Both Sides of Paper"** -> Choose **"Flip on Short Edge"**
4) Click **"Print"**

MAC Printing Directions:
1) Click **File-> Print**
2) Choose **Pages 3-10**
3) Click **"Custom Scale"** and type in **97%**
4) Click **"Printer"** in the lower left corner
5) Select "Media and Quantity" and drop down to select **"Layout"**
6) Under "Two Sided", choose **"Short-Edge binding"**
7) Click "**Print"**
8) Click **"Print"**

Once Printed: Layer the pages as shown below. Flip the top over, then staple.





My

FACTORING POLYNOMIALS

Flip Book

NOTES:

Directions: Factor each polynomial completely.

1 $51x^2 - 17x$

2 $9y^7 + 18y^4$

3 $10p^3 + 120p$

4 $-56c^5 + 8c^9$

65 $a^5b^4 + a^8b$

66 $5u^2 - 405$

67 $10y^2 + 5y - 180$

68 $p^6 - 64$

69 $20k^4 + 3k^2 - 2$

70 $8r^6 + 47r^3 - 6$

MIXED FACTORING

NOTES:

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

59 $81 - 3a^3$

60 $-2q^4 - 10q^2 + 72$

61 $4x^4 - 64$

62 $15p^2 - 29p - 14$

63 $3d^3 - 66d^2 + 216d$

64 $9y^4 - 13y^2 + 4$

5 $77j^2k^5 - 44j^5k^2$

6 $-16m^5n^3 - 24m^2n^4$

7 $36ab^2 + 56a^2b$

8 $15r^2s^2 + 25r^2s^3$

GREATEST COMMON FACTOR

NOTES:

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

9 $4y^2 - 9$

10 $25k^2 - 81$

11 $g^2h^4 - 36$

12 $49x^2 - 100z^2$

53 $4t^3 - 8t^2 - t + 2$

54 $6h^3 - 9h^2 + 10h - 15$

55 $4x^4 + 7x^3 - 32x - 56$

56 $3w^3 - w^2 - 3w + 1$

57 $168m^3 - 63m^2 + 24m - 9$

58 $16y^5 - 48y^4 - y + 3$

FOUR TERMS

NOTES:

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

47 $4f^3 + f^2 + 28f + 7$

48 $7w^3 + w^2 + 7w + 1$

49 $20y^3 + 12y^2 - 25y - 15$

50 $8j^3 - 6j^2 + 28j - 21$

51 $25a^3 - 5a^2 + 35a - 7$

52 $49c^3 + 35c^2 - 14c - 10$

13 $625 - w^4$

14 $9m^2 - 144n^2$

15 $150 - 216p^2$

16 $147c^5 - 27c^3$

DIFFERENCE OF SQUARES $(a^2 - b^2)$

NOTES:

Directions: Factor each polynomial completely. Be sure to always check for a GCF first!

17 $x^3 + 216$	18 $1000w^3 + 1$
19 $27m^3 + n^3$	20 $125j^3 + 729k^3$

41 $3k^2 - 14k - 24$	42 $12m^2 + m - 6$
43 $16x^3 - 48x^2 + 36x$	44 $30w^2 - 51w + 9$
45 $9k^4 - 25k^2 + 16$	46 $4a^4 - 84a^2b^2 - 400b^4$

TRINOMIALS $(ax^2 + bx + c)$

NOTES:

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

35 $w^2 - 13w - 30$

36 $c^3 - 22c^2 + 72c$

37 $a^2 + 10ab - 24b^2$

38 $n^4 + 16n^2 + 39$

39 $3f^2 - 15f - 42$

40 $-2p^2 + 20p - 48$

21 $16v^7 + 250v$

22 $189 + 7p^3$

23 $512g^9 + 1$

24 $1000y^4z^4 + 8yz^7$

SUM OF CUBES $(a^3 + b^3)$

NOTES:

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

25 $a^3 - 729$

26 $343g^3 - 512$

27 $p^6 - q^3$

28 $500w^4 - 4w$

29 $40c^3 - 625d^3$

30 $512 - 8u^3$

31 $4ab^3 - 108a$

32 $81 - 192r^6$

33 $x^8y^2 - x^2y^2$

34 $4mn^6 - 256m^7$

DIFFERENCE OF CUBES $(a^3 - b^3)$

My

FACTORING POLYNOMIALS

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NOTES: Divide by the largest common factor, then leave the remaining factors in parenthesis.

Directions: Factor each polynomial completely.

1 $51x^2 - 17x$

$17x(3x-1)$

2 $9y^7 + 18y^4$

$9y^4(y^3+2)$

3 $10p^3 + 120p$

$10p(p^2+12)$

4 $-56c^5 + 8c^9$

$-8c^5(7-c^4)$

65 $a^5b^4 + a^8b$

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

$a^5b(b+a)(b^2-ab+a^2)$

66 $5u^2 - 405$

$5(u^2-81)$

$5(u+9)(u-9)$

67 $10y^2 + 5y - 180$

$5(2y^2+y-36)$

$5(2y+9)(y-4)$

68 $p^6 - 64$

$(p^3+8)(p^3-8)$

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

$(p^2-4)(p^4+4p^2+16)$

$(p-2)(p+2)(p^4+4p^2+16)$

69 $20k^4 + 3k^2 - 2$

$(5k^2+2)(4k^2-1)$

$(5k^2+2)(2k+1)(2k-1)$

70 $8r^6 + 47r^3 - 6$

$(8r^3-1)(r^3+6)$

$(2r-1)(4r^2+2r+1)(r^3+6)$

MIXED FACTORING

NOTES: Look for a GCF, then factor using other methods.

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

59 $81-3a^3$

$3(27-a^3)$

$\boxed{3(3-a)(9+3a+a^2)}$

60 $-2q^4-10q^2+72$

$-2(q^4+5q^2-36)$

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

$\boxed{-2(q^2+9)(q+2)(q-2)}$

61 $4x^4-64$

$4(x^4-16)$

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

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

62 $15p^2-29p-14$

$\boxed{(5p+2)(3p-7)}$

63 $3d^3-66d^2+216d$

$3d(d^2-22d+72)$

$\boxed{3d(d-18)(d-4)}$

64 $9y^4-13y^2+4$

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

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

5 $77j^2k^5-44j^5k^2$

$\boxed{11j^2k^2(7k^3-4j^3)}$

6 $-16m^5n^3-24m^2n^4$

$\boxed{-8m^2n^3(2m^3+3n)}$

7 $36ab^2+56a^2b$

$\boxed{4ab(9b+14a)}$

8 $15r^2s^2+25r^2s^3$

$\boxed{5r^2s^2(3+5s)}$

GREATEST COMMON FACTOR

NOTES:

$a^2 - b^2 = (a+b)(a-b)$

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

9 $4y^2 - 9$

$(2y+3)(2y-3)$

10 $25k^2 - 81$

$(5k+9)(5k-9)$

11 $g^2h^4 - 36$

$(gh^2+6)(gh^2-6)$

12 $49x^2 - 100z^2$

$(7x+10z)(7x-10z)$

53 $4t^3 - 8t^2 - t + 2$

$4t^2(t-2) - 1(t-2)$

$(4t^2-1)(t-2)$

$(2t+1)(2t-1)(t-2)$

54 $6h^3 - 9h^2 + 10h - 15$

$3h^2(2h-3) + 5(2h-3)$

$(3h^2+5)(2h-3)$

55 $4x^4 + 7x^3 - 32x - 56$

$x^3(4x+7) - 8(4x+7)$

$(x^3-8)(4x+7)$

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

56 $3w^3 - w^2 - 3w + 1$

$w^2(3w-1) - 1(3w-1)$

$(w^2-1)(3w-1)$

$(w+1)(w-1)(3w-1)$

57 $168m^3 - 63m^2 + 24m - 9$

$21m^2(8m-3) + 3(8m-3)$

$(21m^2+3)(8m-3)$

$3(7m^2+1)(8m-3)$

58 $16y^5 - 48y^4 - y + 3$

$16y^4(y-3) - 1(y-3)$

$(16y^4-1)(y-3)$

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

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

FOUR TERMS

NOTES: Group the terms into binomials, finding the GCF from each pair. Factor out the common binomial and write as the product of two binomials.

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

47 $4f^3 + f^2 + 28f + 7$

$f^2(4f+1) + 7(4f+1)$

$\boxed{(f^2+7)(4f+1)}$

48 $7w^3 + w^2 + 7w + 1$

$w^2(7w+1) + 1(7w+1)$

$\boxed{(w^2+1)(7w+1)}$

49 $20y^3 + 12y^2 - 25y - 15$

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

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

50 $8j^3 - 6j^2 + 28j - 21$

$2j^2(4j-3) + 7(4j-3)$

$\boxed{(2j^2+7)(4j-3)}$

51 $25a^3 - 5a^2 + 35a - 7$

$5a^2(5a-1) + 7(5a-1)$

$\boxed{(5a^2+7)(5a-1)}$

52 $49c^3 + 35c^2 - 14c - 10$

$7c^2(7c+5) - 2(7c+5)$

$\boxed{(7c^2-2)(7c+5)}$

13 $625 - w^4$

$(25+w^2)(25-w^2)$

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

14 $9m^2 - 144n^2$

$9(m^2-16n^2)$

$\boxed{9(m+4n)(m-4n)}$

15 $150 - 216p^2$

$6(25-36p^2)$

$\boxed{6(5+6p)(5-6p)}$

16 $147c^5 - 27c^3$

$3c^3(49c^2-9)$

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

DIFFERENCE OF SQUARES $(a^2 - b^2)$

NOTES: $(a^3+b^3) = (a+b)(a^2-ab+b^2)$

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

17 x^3+216

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

18 $1000w^3+1$

$(10w+1)(100w^2-10w+1)$

19 $27m^3+n^3$

$(3m+n)(9m^2-3mn+n^2)$

20 $125j^3+729k^3$

$(5j+9k)(25j^2-45jk+81k^2)$

41 $3k^2-14k-24$

$(3k+4)(k-6)$

42 $12m^2+m-6$

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

43 $16x^3-48x^2+36x$

$4x(4x^2-12x+9)$

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

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

44 $30w^2-51w+9$

$3(10w^2-17w+3)$

$3(5w-1)(2w-3)$

45 $9k^4-25k^2+16$

$(9k^2-16)(k^2-1)$

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

46 $4a^4-84a^2b^2-400b^4$

$4(a^4-21a^2b^2-100b^4)$

$4(a^2+4b^2)(a^2-25b^2$

$4(a^2+4b^2)(a+5b)(a-5b)$

TRINOMIALS (ax^2+bx+c)

NOTES: Given ax^2+bx+c:

- if $a=1$: find factors of "c" that add up to "b".
- if $a \neq 1$: use the slip and slide method.

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

35 $w^2-13w-30$

$(w-15)(w+2)$

36 c^3-22c^2+72c

$c(c^2-22c+72)$

$c(c-18)(c-4)$

37 $a^2+10ab-24b^2$

$(a+12b)(a-2b)$

38 n^4+16n^2+39

$(n^2+3)(n^2+13)$

39 $3f^2-15f-42$

$3(f^2-5f-14)$

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

40 $-2p^2+20p-48$

$-2(p^2-10p+24)$

$-2(p-6)(p-4)$

21 $16v^7+250v$

$2v(8v^6+125)$

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

22 $189+7p^3$

$7(27+p^3)$

$7(3+p)(9-3p+p^2)$

23 $512g^9+1$

$(8g^3+1)(64g^6-8g^3+1)$

$(2g+1)(4g^2-2g+1)(64g^6-8g^3+1)$

24 $1000y^4z^4+8yz^7$

$8yz^4(125y^3+z^3)$

$8yz^4(5y+z)(25y^2-5yz+z^2)$

SUM OF CUBES (a^3+b^3)

NOTES:

$$(a^3 - b^3) = (a-b)(a^2 + ab + b^2)$$

Directions: Factor each polynomial completely. **Be sure to always check for a GCF first!**

25 $a^3 - 729$

$(a-9)(a^2+9a+81)$

26 $343g^3 - 512$

$(7g-8)(49g^2+56g+64)$

27 $p^6 - q^3$

$(p^2-q)(p^4+p^2q+q^2)$

28 $500w^4 - 4w$

$4w(125w^3-1)$

$4w(5w-1)(25w^2+5w+1)$

29 $40c^3 - 625d^3$

$5(8c^3-125d^3)$

$5(2c-5d)(4c^2+10cd+25d^2)$

30 $512 - 8u^3$

$8(64-u^3)$

$8(4-u)(16+4u+u^2)$

31 $4ab^3 - 108a$

$4a(b^3-27)$

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

32 $81 - 192r^6$

$3(27-64r^6)$

$3(3-4r^2)(9+12r^2+16r^4)$

33 $x^8y^2 - x^2y^2$

$x^2y^2(x^6-1)$

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

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

$x^2y^2(x^6-1)$

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

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

34 $4mn^6 - 256m^7$

$4m(n^6-64m^6)$

$4m(n^3-8m^3)(n^3+8m^3)$

$4m(n-2m)(n+2m)(n^2+2mn+4m^2)(n^2-2mn+4m^2)$

$4m(n^6-64m^6)$

$4m(n^2-4m^2)(n^4+4m^2n^2+16m^4)$

$4m(n+2m)(n-2m)(n^4+4m^2n^2+16m^4)$

DIFFERENCE OF CUBES $(a^3 - b^3)$