

# Factoring



Keep in mind...

No one is perfect...that's why pencils have erasers.

## I. Greatest Common Factor (GCF)

Find the GCF of the numbers.

$$\begin{array}{l} 18, 30 \\ 18 = 2 \cdot 3 \cdot 3 \\ 30 = 2 \cdot 3 \cdot 5 \\ 2 \cdot 3 = 6 \\ 6 = \text{GCF} \end{array}$$

1. 12, 18

5. 28, 49

2. 10, 35

6. 27, 63

3. 8, 30

7. 30, 45

4. 16, 24

8. 48, 72

## II. Greatest Common Monomial Factor

Factor, write prime if prime.

$$12a^3b + 15ab^3 = 3ab(4a^2 + 5b^2)$$

1.  $6x + 3$

8.  $12x^2 - 9x + 15$

2.  $24x^2 - 8x$

9.  $3n^3 - 12n^2 - 30n$

3.  $6x - 12$

10.  $9m^2 - 4n + 12$

4.  $2x^2 + 8x$

11.  $2x^3 - 3x^2 + 5x$

5.  $4x + 10$

12.  $13m + 26m^2 - 39m^3$

6.  $10x^2 + 35x$

13.  $17x^2 + 34x + 51$

7.  $10x^2y - 15xy^2$

14.  $18m^2n^4 - 12m^2n^3 + 24m^2n^2$



# Factoring

## Factoring the Difference of Two Squares

$$a^2 - 36 = (a + 6)(a - 6)$$
$$3x^2 - 48 = 3(x^2 - 16) = 3(x + 4)(x - 4)$$

Factor, write prime if prime.

1.  $x^2 - 1$

12.  $-x^2 + 16$

2.  $x^2 - 9$

13.  $36m^2 - 121$

3.  $x^2 + 4$

14.  $2x^2 - 8$

4.  $x^2 - 25$

15.  $25 + 4x^2$

5.  $9y^2 - 16$

16.  $4a^2 - 81b^2$

6.  $4x^2 - 25$

17.  $12x^2 - 75$

7.  $9x^2 - 1$

18.  $a^2b - b^3$

8.  $a^2 - x^2$

19.  $-98 + 2x^2$

9.  $25 - m^2$

20.  $5x^2 - 45y^2$

10.  $x^2 - 16y^2$

21.  $9x^4 - 4$

11.  $25m^2 - n^2$

22.  $16x^4 - y^2$



## Factoring Trinomials: $x^2 + bx + c$

$$x^2 + 7x + 10 = (x)^2 + (2 + 5)x + (2)(5) = (x + 2)(x + 5)$$

Factor, write prime if prime.

1.  $x^2 + 6x + 8$

12.  $x^2 - x - 6$

2.  $c^2 + 5c + 6$

13.  $y^2 + 3y - 18$

3.  $y^2 - 9y + 14$

14.  $b^2 + 7b - 18$

4.  $x^2 - 10x + 16$

15.  $a^2 + a - 56$

5.  $a^2 + 12a + 27$

16.  $c^2 - 4c - 12$

6.  $x^2 - 14x + 24$

17.  $x^2 - 9x - 36$

7.  $x^2 - 15x + 36$

18.  $y^2 + 4y - 21$

8.  $y^2 + 21y + 54$

19.  $x^2 - 22x - 75$

9.  $m^2 + 13m - 36$

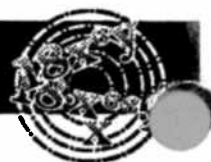
20.  $x^2 - 3x - 40$

10.  $x^2 - 8x + 15$

21.  $45 + 14y + y^2$

11.  $y^2 - 4y - 32$

22.  $x^2 - 13x + 36$



## Factoring Trinomials: $ax^2 + bx + c$

$$2x^2 - 5x - 3 = (2x + 1)(x - 3)$$

Factor, write prime if prime.

1.  $2x^2 - 5x - 3$

11.  $2n^2 - 3n - 14$

2.  $3x^2 + 10x - 8$

12.  $5n^2 + 2n + 7$

3.  $2y^2 + 15y + 7$

13.  $10x^2 + 13x - 30$

4.  $7a^2 - 11a + 4$

14.  $12y^2 + 7y + 1$

5.  $5n^2 + 17n + 6$

15.  $2n^2 + 9n - 5$

6.  $4y^2 + 8y + 3$

16.  $2x^2 + 7x + 6$

7.  $3x^2 + 4x - 7$

17.  $5a^2 - 42a - 27$

8.  $2x^2 + 13x + 15$

18.  $15x^2 - 28x - 32$

9.  $9y^2 + 6y - 8$

19.  $8a^2 - 10a + 3$

10.  $6x^2 - 7x - 20$

20.  $2y^2 - 3y - 20$



## Factoring: Putting It All Together

$$5x^2 + 20x - 60 = 5(x^2 + 4x - 12) = 5(x + 6)(x - 2)$$

Factor completely, write prime if prime.

1.  $2x^2 - 8$

9.  $4x^2 + 16x + 16$

2.  $2x^2 + 8x + 6$

10.  $18x + 12x^2 + 2x^3$

3.  $3n^2 + 9n - 30$

11.  $2x - 2xy^2$

4.  $6x^2 - 26x - 20$

12.  $3t^3 - 27t$

5.  $2x^2 + 12x - 80$

13.  $24a^2 - 30a + 9$

6.  $5t^2 + 15t + 10$

14.  $10x^2 + 15x - 10$

7.  $8n^2 - 18$

15.  $3x^2 - 42x + 147$

8.  $14x^2 + 7x - 21$

16.  $4x^4 - 4x^2$



# Factoring

## ...More Factoring: Putting It All Together

1.  $16x^2 - 40x - 24$

8.  $x^4 - 3x^2 - 4$

2.  $27x^2 - 36x + 12$

9.  $h^2 - (a^2 - 6a + 9)$

3.  $5x^2 - 60x - 140$

10.  $81x^4 - 16y^4$

4.  $6m^3 + 54m^2 - 6m$

11.  $4mn^2 - 4m^2n^2 + m^3n^2$

5.  $5k^4 + 8k^3 - 4k^2$

12.  $(2a + 3)^2 - (a - 1)^2$

6.  $x^2y^4 - x^6$

13.  $16d^8 - 8d^4 + 1$

7.  $y^4 - 6y^2 - 16$

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