

5.6 Summary of Factoring

Guidelines for Factoring Polynomials
Factoring Polynomials

Key Terms

Use the expressions listed below to complete the statements in Steps 1-3 below. Note that some expressions may not be used.

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

Guidelines for Factoring Polynomials

STEP 1: Factor out the greatest common factor, if possible.

STEP 2: A. If the polynomial has *four terms*, try factoring by grouping.

B. If the polynomial is a *binomial*, try one of the following.

1. $a^2 - b^2 =$ _____ Difference of two squares

2. $a^3 - b^3 =$ _____ Difference of two cubes

3. $a^3 + b^3 =$ _____ Sum of two cubes

C. If the polynomial is a *trinomial*, check for a perfect square.

1. $a^2 + 2ab + b^2 =$ _____ Perfect square trinomial

2. $a^2 - 2ab + b^2 =$ _____ Perfect square trinomial
Otherwise, apply FOIL or grouping.

STEP 3: Check to make sure that the polynomial is *completely* factored.

Factoring Polynomials*Exercises 1-30: Factor each polynomial, if possible.*

1. $t^2 - t$

1. _____

2. $4x^3 - 16x$

2. _____

3. $5a^3 + 25a$

3. _____

4. $t^2 - 64$

4. _____

5. $3x^3 - 12x^2$

5. _____

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6. $4x^3 - 36x$

6. _____

7. $x^4 - 81$

7. _____

8. $3x^4 - 48$

8. _____

9. $5x^5 - 5x$

9. _____

10. $4x^2 - 20x + 25$

10. _____

11. $20 - 60x + 45x^2$

11. _____

12. $36x^3 + 24x^2 + 4x$

12. _____

13. $3x^3 + 81$

13. _____

14. $-8t^4 + 64t$

14. _____

15. $3a^3 + 375$

15. _____

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16. $x^3 + 4x^2 + x + 4$

16. _____

17. $-2x^3 + 6x^2 - 10x + 30$

17. _____

18. $3x^3 - 12x^2 - 6x + 24$

18. _____

19. $2x^4 - 5x^3 - 3x^2$

19. _____

20. $20x^3 - 36x^2 - 8x$

20. _____

21. $-12x^3 - 12x^2 + 45x$

21. _____

22. $-42a^2 - 49a + 35$

22. _____

23. $16x^2 - 9a^2$

23. _____

24. $3r^3 - 81t^6$

24. _____

25. $16a^4 - 25b^2$

25. _____

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26. $-12x^4 - 10x^3 + 8x^2$

26. _____

27. $-3x^4 + 30x^3 - 27x^2$

27. _____

28. $2x^5 - 18x^3 - 16x^2 + 144$

28. _____

29. $a^2b^2 - 17a^2b + 16a^2$

29. _____

30. $7rt^5 - 7rt^3 - 7rt^2 + 7r$

30. _____