

The Weekly Rigor

No. 282

“A mathematician is a machine for turning coffee into theorems.”

November 16, 2019

39 Problems in Factoring by the Sum or Difference of Cubes

(Part 1)

PROBLEMS

For each of the following expressions, factor by the method “sum of cubes” or “difference of cubes.”

1. $x^3 + 4^3$

2. $x^3 - 4^3$

3. $x^3 - 1^3$

4. $x^3 + 8$

5. $x^3 + 27$

6. $x^3 - 64$

7. $8 - x^3$

8. $1 + x^3$

9. $64 + x^3$

10. $8x^3 - 27$

11. $27x^3 - 1$

12. $64x^3 + 27$

13. $27 + 8x^3$

14. $64 - 8x^3$

15. $1 - 8x^3$

16. $8x^3 + y^3$

17. $64x^3 + y^3$

18. $125x^3 - y^3$

19. $x^3 - 8y^3$

20. $x^3 + 27y^3$

21. $x^3 + 125y^3$

22. $8x^3 - 27y^3$

23. $64x^3 - 27y^3$

24. $125x^3 + 64y^3$

25. $(x + y)^3 + 8$

26. $(x - y)^3 - 64$

27. $8 - (x + y)^3$

28. $64 + (x - y)^3$

29. $8(x + y)^3 + 27$

30. $64(x - y)^3 - 1$

31. $(x + 3)^3 - (x + 5)^3$

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

33. $x^6 + y^6$

34. $x^6 - y^6$

35. $(3x - 6)^3 - 27$

36. $(2x - 5)^3 + 8$

37. $\cos^3(\theta) + \sin^3(\theta)$

38. $\cos^3(\theta) - \sin^3(\theta)$

39. $e^{3x} - \ln^3(x)$

“Only he who never plays, never loses.”