Factoring:

Sum and Difference of Cubes

1. $z^3+1=(z+1)(z^2-z+1)$

2. $x^6-8=(z^2-2)(z^4+2z^2+4)$

3. $27y^3-8=(3y-2)(9y^2+6y+4)$

4. $m^3+64n^3=(m+4n)(m^2-4mn+16n^2)$

5. $r^3s^3+a^3b^3=(rs+ab)(r^2s^2-abrs+a^2b^2)$

6. $64d^6-125e^3=(4d^2-5e)(16d^4+20d^2e+25e^2)$

7. $2m^3+2n^3=2(m+n)(m^2-mn+n^2)$

8. $3x^3-3y^3=3(x-y)(x^2+xy+y^2)$

9. $x^6-y^6=(x^2-y^2)(x^4+x^2y^2+y^4)$

10. $a^6-b^6=(a^2-b^2)(a^4+a^2b^2+b^4)$

11. $4-4x^3y^3=4(1-xy)(1+xy+x^2y^2)$

12. $5+5a^3b^6=5(1+ab^2)(1-ab^2+a^2b^4)$

13. $w^3-1=(w-1)(w^2+w+1)$

14. $p^3-125=(p-5)(p^2+5p+25)$

15. $x^3y^3-64=(xy-4)(x^2y^2+4xy+16)$

16. $z^6-216=(z^2-6)(z^4+6z^2+36)$

17. $27y^3-64x^9=(3y-4x^3)(9y^2+12x^3y+16x^6)$

18. $x^3-\frac{1}{8}=\left(x-\frac{1}{2}\right)\left(x^2+\frac{1}{2}x+\frac{1}{4}\right)$

19. $z^3+\frac{1}{27}=\left(z+\frac{1}{3}\right)\left(z^2-\frac{1}{3}z+\frac{1}{9}\right)$

20. $8z^6-\frac{1}{125}=\left(2z^2-\frac{1}{5}\right)\left(4z^4+\frac{2}{5}z^2+\frac{1}{25}\right)$

21. $\frac{27}{343}x^3-y^6=\left(\frac{3}{7}x-y^2\right)\left(\frac{9}{49}x^2+\frac{3}{7}xy^2+y^4\right)$

22. $x^4-xy^6=x(x-y^2)(x^2+xy^2+y^4)$

23. $x^5y^7z^{11}-x^2y^{10}z^2=x^2y^7z^2(x^3z^9-y^3)=x^2y^7z^2(xz^3-y)(x^2z^6+xz^3y+y^2)$

24. $5x^3-40z^3=5(x^3-8z^3)=5(x-2z)(x^2+2xz+4z^2)$

25. $(a+b)^3-64=\left[(a+b)-4\right]\left[(a+b)^2+4(a+b)+16\right]$

26. $(2x-3)^3+(3y-1)^3=\left[(2x-3)+(3y-1)\right]\left[(2x-3)^2-(2x-3)(3y-1)+(3y-1)^2\right]$

27. $x^{6a}+y^{6b}=(x^{2a}+y^{2b})(x^{4a}-x^{2a}y^{2b}+y^{4b})$

28. $3x^{3a}+24y^{3b}=3(x^{3a}+8y^{3b})=3(x^a+2y^b)(x^{2a}-2x^ay^b+4y^{2b})$