Factoring the Sum or Difference of Two Cubes

$a^3 \pm b^3 = (a \pm b)(a^2 \mp ab + b^2)$

same — opposite — always positive

Factor completely.

1) $x^3 + 1$

$x \quad 1$

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

2) $y^3 - 8$

$y \quad 2$

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

3) $z^3 - 64$

$z \quad 4$

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

4) $m^3 + 27$

$m \quad 3$

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

5) $1 - t^3$

$1 \quad t$

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

6) $125 + w^3$

$5 \quad w$

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

7) $8 - z^3$

$2 \quad z$

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

8) $1000 - n^3$

$10 \quad n$

$(10-n)(100+10n+n^2)$

9) $8x^3 + 27$

$2x \quad 3$

$(2x+3)(4x^2-6x+9)$

10) $64 - 27b^3$

$4 \quad 3b$

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

11) $8m^3 - 27r^3$

$2m \quad 3r$

$(2m-3r)(4m^2+6mr+9r^2)$

12) $125a^3 + 8b^3$

$5a \quad 2b$

$(5a+2b)(25a^2-10ab+4b^2)$