

Factor the sum or difference of cubes.

1.  $x^3 + 64$   
 $(x+4)(x^2-4x+16)$

2.  $x^3 - 1000$   
 $(x-10)(x^2 + 10x + 100)$

3.  $8x^3 - 1$   
 $(2x-1)(4x^2+2x+1)$

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

5.  $27x^3 + 512$   
 $(3x+8)(9x^2-24x+64)$

6.  $1000x^3 - 1$   
 $(10x-1)(100x^2+10x+1)$

512  
 $\sqrt{256}$   
 $2 \sqrt{128}$   
 $2 \sqrt{64}$   
 $2 \sqrt{32}$   
 $2 \sqrt{16}$   
 $2 \sqrt{8}$   
 $2 \sqrt{4}$   
 $2 \sqrt{2}$

Factor the polynomial by grouping.

7.  $(x^3 - 3x^2) + (5x - 15)$   
 $x^2(x-3) + 5(x-3)$   
 $(x^2+5)(x-3)$

8.  $(x^3 + 2x^2) + (7x + 14)$   
 $x^2(x+2) + 7(x+2)$   
 $(x^2+7)(x+2)$

9.  $(5x^3 + 5x^2) + (x + 1)$   
 $5x^2(x+1) + 1(x+1)$   
 $(5x^2+1)(x+1)$

10.  $(x^3 - 2x^2) - (4x + 8)$   
 $x^2(x-2) - 4(x-2)$   
 $(x^2-4)(x-2)$   
 $(x-2)^2(x+2)$

11.  $(x^3 + x^2) - (16x + 16)$   
 $x^2(x+1) - 16(x+1)$   
 $(x^2-16)(x+1)$   
 $(x-4)(x+4)(x+1)$

12.  $16x^3 - 48x^2 - x + 3$   
 $16x^2(x-3) - 1(x-3)$   
 $(16x^2-1)(x-3)$   
 $(4x-1)(4x+1)(x-3)$

Factor the Polynomial.

13.  $16x^4 - 81$

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

16.  $2x^4 - 200x^2$

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

14.  $x^4 + 5x^2 + 6$

$$(x^2 + 3)(x^2 + 2)$$

17.  $27x^4 - 3x^2$

$$3x^2(9x^2 - 1)$$
$$3x^2(3x - 1)(3x + 1)$$

15.  $x^4 + 5x^2 - 24$

$$(x^2 - 3)(x^2 + 8)$$

18.  $2x^4 + 16x^2 + 24$

$$2(x^2 + 8x^2 + 12)$$
$$2(x^2 + 6)(x^2 + 2)$$