



Factor each sum or difference in cubes.

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

9.  $27x^3 - 1$

10.  $8 + 64x^3$

11. Divide  $(k^4 + 7k^3 - 17k^2 + 2k - 63)$  by  $(k + 9)$  using long division.

12. Now check #11 using synthetic division.

13. Is  $(k + 9)$  a factor of  $(k^4 + 7k^3 - 17k^2 + 2k - 63)$  ?

For 14 – 16, factor using the most appropriate method.

14.  $12x^4 - 13x^2 + 3$

15.  $16m^3 - 6m^2 + 24m - 9$

16.  $2a^3 + 12a^2 + 10a$

Solve.

17.  $d^6 - 4d^4 - 9d^2 + 36 = 0$

18.  $x^3 - 3x^2 - 5x = -15$

### Application

19. Suppose you know the volume of the following prism is  $V = 3x^3 - 10x^2 - 27x + 10$ . If one side is  $(x + 2)$ , find the lengths of the two other sides.

