4.4 **Notetaking with Vocabulary** (continued)

The Factor Theorem

A polynomial $f(x)$ has a factor $x - k$ if and only if $f(k) = 0$.

Notes:

Extra Practice

In Exercises 1–14, factor the polynomial completely.

1. $20x^3 - 220x^2 + 600x$

2. $m^5 - 81m$

3. $27a^3 + 8b^3$

4. $5t^6 + 2t^5 - 5t^4 - 2t^3$

5. $y^4 - 13y^2 - 48$

6. $5p^3 + 5p - 5p^2 - 5$

7. $810k^4 - 160$

8. $a^5 + a^3 - a^2 - 1$

4.4 **Notetaking with Vocabulary** (continued)

9. $2x^6 - 8x^5 - 42x^4$

10. $5z^3 + 5z^2 - 6z - 6$

11. $12x^2 - 22x - 20$

12. $3m^2 - 48m^6$

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

14. $5m^4 - 70m^3 + 245m^2$

In Exercises 15–17, show that the binomial is a factor of the polynomial. Then factor the function completely.

15. $f(x) = x^3 - 13x - 12; \; x + 1$

16. $f(x) = 6x^3 + 8x^2 - 34x - 12; \; x - 2$

17. $f(x) = 2x^4 - 12x^3 + 6x^2 + 20x; \; x - 5$