

6-4**Practice****Polynomials, Linear Factors, and Zeros**

Write each polynomial in factored form.

1. $x^3 + 11x^2 + 30x$

To start, factor out the GCF, x .

$x(x^2 + 11x + 30)$

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

3. $x^2 - 4x - 12$

4. $x^3 - 81x$

5. $x^3 + 9x^2 + 18x$

Find the zeros of each function.

6. $y = (x + 2)(x + 3)$

7. $y = x(x - 1)(x + 3)$

8. $y = (x - 4)(x - 1)$

9. $y = x(x - 5)(x + 2)$

Write a polynomial function in standard form with the given zeros.

10. $x = -2, 1, 4$

To start, write a linear factor for each zero.

$(x - (-2))(x - 1)(x - 4)$

Simplify

$(x + 2)(x - 1)(x - 4)$

11. $x = 3, 0$

12. $3, -8, 0$

13. $x = 3, -2, 1$

14. $x = -4, 1$

6-4 Practice (continued)

Polynomials, Linear Factors, and Zeros

Find the zeros of each function. State the multiplicity of multiple zeros.

15. $y = (x - 3)^2(x + 1)$

To start, identify the zeros.

The zeros are 3 and -1.

16. $y = x^2 + 3x + 2$

17. $y = (x + 5)^2$

18. $y = (x - 9)^2$

19. $y = 2x^2 - 2x$

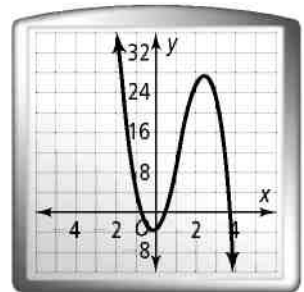
Find the relative maximum and relative minimum of the graph using GeoGebra.

20. $f(x) = -3x^3 + 10x^2 + 6x - 3$

To start, use a graphing calculator.

(An approximate viewing window is

$-5 \leq x \leq 5$ and $-10 \leq y \leq 30$.)



21. $f(x) = x^3 + 4x^2 - x + 1$

22. $f(x) = x^3 - 6x + 9$