Name_____ Class_____Date_____

5-2 Practice

Form K

Polynomials, Linear Factors, and Zeros

Write each polynomial in factored form. Check by multiplication.

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. Then graph the 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. $x = -4, 1$

Name_____ Class_____Date_____

5-2 Practice (continued) *Form K*

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

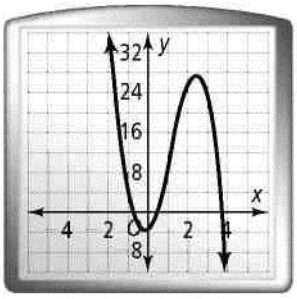
19. $y = 2x^2 - 2x$

Find the relative maximum and relative minimum of the graph of each function.

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

To start, use a graphing calculator.

(An approximate viewing window is $-5 \le x \le 5$ and $-10 \le y \le 30$.)



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

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

23. Reasoning A polynomial function has a zero at $x = b$. Find one of its factors.

24. The side of a cube measures $2x + 1$ units long. Express the volume of the cube as a polynomial.

25. The length of a box is 2 times the height. The sum of the length, width, and height of the box is 10 centimeters.

a. Write expressions for the dimensions of the box.

b. Write a polynomial function for the volume of the box. (To start, write the function in factored form).

c. Find the maximum volume of the box and the dimensions of the box that generates this volume.