Unit 2 Review - Polynomials   NAME _____

Operations With Polynomials
Simplify each expression. Pay close attention to whether you are adding, subtracting, or multiplying!!

1. $(9m^2 - 4m + 5) - (2m^2 + 3)$

2. $-2k^3\left(-4k^2 + 5k + 2\right)$

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

4. $\left(7b^3 - 5 - 3b^4 + 9b^2\right) + \left(-9b^4 - 5b^3 - 9 + 3b^2\right)$

5. $7c^2d\left(c^3d + 4d^4\right)$

6. $(4y - 9)^2$

7. $(2x + 3)(x^2 + 12x + 27)$

8. $(4v^3 + v^2 + 3v - 2) - (2v^3 + v^2 + 2v - 5)$

Evaluate Polynomials
Given $f(x) = 4x^3 + 3x^2 - 5$, find:

9. $f(-2)$

10. $f(4d)$

11. $f(p)$

Synthetic Division
Use synthetic division to simplify each expression.

12. $(2x^4 - x^3 - 6x^2 + 9x + 1) \div (x - 1)$
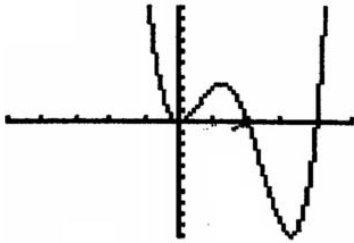
13. $(x^3 + 8x^2 - 13) \div (x - 3)$

14. $(13x - 4x^2 + 6x^3 + 3) \div (x + 2)$

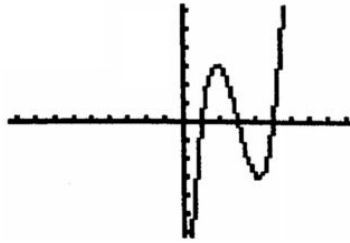14. $(2x^2 - 23x + 45) \div (x - 9)$

Graphs of Polynomials

For each graph, state the zeroes and their multiplicity. Then use the end behavior to determine if the leading coefficient is positive or negative and has an even or odd exponent.
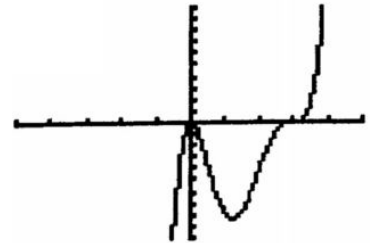
16.

17.

18.

Applications of Polynomials

20. The lengths of the sides of a triangle are $2x - 1$, $4x - 3$, and $5x + 2$. Determine the perimeter.

21. The equation $p(n) = \frac{12}{5}n^2 - 17$ represents the overall profit from production for a company where p is the total profit in dollars and n is the number of hours per day that the production line operates. Determine the profit when $n = 10.5$ hours.

23. A rectangular wall is $4x - 5$ feet high and $2x + 7$ feet wide. Determine the area of the wall.

22. A rectangle has an area of $x^3 - 5x^2 + 3x + 1$ square meters and a width of $x - 1$ meters. Find its length.