NAME_____ PERIOD_____ DATE_____

POLYNOMIAL WORKSHEET

Perform the indicated operation to write each polynomial in standard form.

1. $(x^2 - 3)(x^2 + 3x - 1)$

2. $(5x^2 - 3x - 7) - (x^2 + 2x - 5)$

3. $(x^3 - 8) \div (x - 2)$

4. $(x + 1)(x - 2)(x + 3)$

5. $(x + 1) - (x - 2) - (x + 3)$

6. $(x + 2)(2x^2 - 5x + 7)$

7. $\frac{x^3 - 2x^2 - 65x + 18}{x - 9}$

8. $(x^2 - 3x + 2) - (2 - x + 2x^2)$

9. $(x^2 - 3x + 2)(2 - x + 2x^2)$

10. $\frac{x^3 - x^2 - 5x - 3}{x - 3}$

11. $(x^2 + 7x - 12)(x^2 - 9x + 1)$

12. $(2x^3 - 6x^2 - 7x - 2) + (x^3 + x^2 + 6x - 12)$

13. $(x^3 - 8)(x^2 - 4x + 4)$

14. $(x^3 - 2x^2 - 5x + 6) \div (x + 2)$

15. $(x^3 + 2x^2 - 3x - 1) + (4 - x - x^3)$

For Exercises 16-19, re-write each polynomial in standard form by applying the operations in the appropriate order.

16. $\frac{(x^2+5x+20)+(x^2+6x-6)}{x+2}$

17. $(x^2-4)(x+3)-(x^2+2x-5)$

18. $\frac{(x-3)^3}{x^2-6x+9}$

19. $(x+7)(2x-3)-(x^3-2x^2+x-2)\div(x-2)$

20. What would be the first and last terms of the polynomial if it was re-written in standard form? Answer these quickly without performing all of the indicated operations.
    a. $(2x^3 - x^2 - 9x + 7) + (11x^2 - 6x^3 + 2x - 9)$

    b. $(x - 3)(2x + 3)(x - 1)$

    c. $(2x - 3)(3x + 5) - (x + 1)(2x^2 - 6x + 3)$

    d. $(x + 5)(3x - 1) - (x - 4)^2$

21. What would the first and last terms of the polynomial be if it was re-written in standard form?
    a. $(n + 1)(n + 2)(n + 3) \dots (n + 9)(n + 10)$

    b. $(x - 2)^{10}$

    c. $\frac{(x-2)^{10}}{(x-2)}$

    d. $\frac{n(n+1)(2n+1)}{6}$

22. The profit a business earns by selling x items is given by the polynomial function

$$p(x) = x(160 - x) - (100x + 500).$$

What is the last term in the standard form of this polynomial? What does it mean in this situation?

23. Explain why these two quotients are different. Compute each one. What do they have in common? Why?

$$\frac{(x-2)^4}{x-2} \text{ and } \frac{x^4-16}{x-2}$$

24. What are the area and perimeter of the figure? Assume a right angle at each vertex.