Unit 2 HW 9 Review

Decide whether each function below is a polynomial. If it is, write the function in standard form. If it is not, explain why.

1. $f(x) = 3\sqrt{3} - 5x$

2. $f(x) = (1/x^2) + (1/x) + x^2$

3. $f(x) = 5x^4 - 2x^2 + 8 - 3x$

4. $f(x) = \frac{1}{2}x^3 + 2x + 3x^2 + 4$

Polynomials can be classified by the number terms as well as by the degree of the polynomial. The degree of the polynomial is the same as the term with the highest degree. Complete the following chart.

Polynomial	Number of terms	Classification	Degree	classification
$f(x) = x + 4$	**5.** 2	**6.** Binomial	**7.** 1	**8.** linear
$f(x) = 5x^3 + x + 3$	**9.** 3	**10.** Trinomial	**11.** 3	**12.** Cubic
$f(x) = 2x^2 + 1$	**13.** 2	**14.** Binomial	**15.** 2	**16.** Quadratic

Find the sum, difference or product of the following. Write the answer in standard form.

17. $(x^2 + 2x + 7) + (3x^2 + 4x)$

$4x^2 + 6x + 7$

18. $(2x^4 + 3x^3 + 6) - (x^4 + 4x^3 + 13x^2 + 2)$

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

19. $(x^2 + 2)(x + 1)$

$x^3 + x^2 + 2x + 2$

20. $(-3x - 2)(3x^2 - x + 1)$

$-9x^3 - 3x^2 - x - 2$

21. $(x - 25)^2$

$x^2 - 50x - 625$

22. $(x^2 + 2x + 4)^2$

$x^4 + 4x^3 + 12x^2 + 16x + 16$

Find the inverse of the given function.

23. $f(x) = 3x - 4$

$y = \frac{1}{3}x + \frac{4}{3}$

24. $f(x) = \frac{1}{3}x + 2$

$y = 3x - 6$

Use function composition to determine if the functions are inverses. SHOW YOUR WORK.

25. $f(x) = 3x + 2,\ g(x) = \frac{1}{3}x - \frac{2}{3}$

$g(f(x)) = \frac{1}{3}(3x+2) - \frac{2}{3}$

$= x + \frac{2}{3} - \frac{2}{3}$

$= x$

$f(g(x)) = 3(\frac{1}{3}x - \frac{2}{3}) + 2$

$= x - 2 + 2$

$= x$

Yes

26. $f(x) = 0.5x + 2,\ g(x) = 2x - 2$

$f(g(x)) = 0.5(2x-2) + 2$

$= 1x - 1 + 2$

$= x + 1$

$g(f(x)) = 2(0.5x+2) - 2$

$= 1x + 1 - 2$

$= x - 1$

NO

Find the coefficient of the given term in the specified row of Pascal's Triangle.

27. *row 7, term 3*

$\binom{7}{3}$ means $\frac{7!}{3!(7-3)!}$ 35

28. *row 9, term 4*

$\binom{9}{4}$ means $\frac{9!}{4!(9-4)!} = 126$

Expand each binomial using the Binomial Theorem or Pascal's Triangle.

29. $(-6x + 2)^3$

$-216x^3 + 216x^2 - 72x + 8$

30. $(3x + y)^5$

$243x^5 + 405x^4y + 270x^3y^2 + 90x^2y^3 + 15xy^4 + y^5$

Find the given term in the expanded form of each binomial.

31. $(4x + 2)^8$, *term 5*

$229376x^4$

32. $(-2x - y)^{13}$, *term 4*

$-366080x^9y^4$