

Determine whether the algebraic expression is a polynomial (Yes or No). If it is a polynomial, determine the degree and state if it is a monomial, binomial, or trinomial. If it is a polynomial with more than 3 terms, identify the expression as polynomial.

1)  $-14a^5$

1) \_\_\_\_\_

2)  $9x^4 + 9x^5 - 4x^3 + 12$

2) \_\_\_\_\_

For the given functions  $f$  and  $g$ , find the requested function.

3)  $f(x) = 5x - 3$ ;  $g(x) = -4x + 2$

Find  $(f + g)(-2)$ .

3) \_\_\_\_\_

Simplify the polynomial by adding or subtracting, as indicated. Express your answer as a single polynomial in standard form.

4)  $(8x^5 + 19x^4 - 15) - (-3x^4 + 5x^5 - 5)$

4) \_\_\_\_\_

5)  $(7x^2 - xy - y^2) + (x^2 + 5xy + 12y^2)$

5) \_\_\_\_\_

Find the product.

6)  $(11x^4y)(-8x^3y^2)$

6) \_\_\_\_\_

7)  $4y(6y^2 - 2y)$

7) \_\_\_\_\_

8)  $4ax^5(8ax^3 + 10x^2 - 8a)$

8) \_\_\_\_\_

Find the product of the two binomials.

9)  $(5x - 1)(x - 6)$

9) \_\_\_\_\_

$$10) (x - 12)(x - 12)$$

10) \_\_\_\_\_

$$11) (x + 9y)(x - 3y)$$

11) \_\_\_\_\_

$$12) (-5x - 3)(-3x - 12)$$

12) \_\_\_\_\_

Find the product of the polynomials.

$$13) (a + b)(a^2 - ab + b^2)$$

13) \_\_\_\_\_

$$14) (4 - p)(6 - 7p + 3p^2)$$

14) \_\_\_\_\_

Find the special product.

15)  $(x + 8)(x - 8)$

15) \_\_\_\_\_

16)  $(12 + m)(12 - m)$

16) \_\_\_\_\_

17)  $(x - 11)^2$

17) \_\_\_\_\_

18)  $(x + 9)^2$

18) \_\_\_\_\_

Divide and simplify.

19)  $\frac{27r^6 - 45r^4}{9r}$

19) \_\_\_\_\_

$$20) \frac{15x^7 - 10x^5}{-5x^7}$$

20) \_\_\_\_\_

Divide using long division.

$$21) \frac{x^2 + 12x + 32}{x + 4}$$

21) \_\_\_\_\_

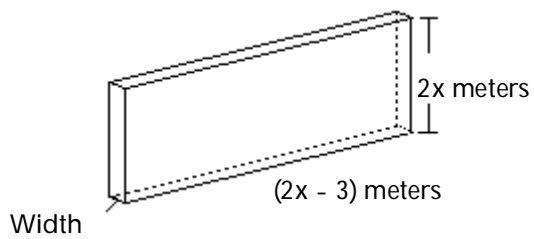
$$22) \frac{15x^3 + 19x^2 - 3x + 14}{-3x - 2}$$

22) \_\_\_\_\_

Solve the problem.

23)

23) \_\_\_\_\_



If the volume of a box is  $(12x^3 - 10x^2 - 12x)$  cubic meters, its height is  $2x$  meters, and its length is  $(2x - 3)$  meters, find its width.

Divide using synthetic division.

$$24) \frac{5m^2 + 30m - 35}{m + 7}$$

24) \_\_\_\_\_

$$25) \frac{5m^3 + 22m^2 - 45m + 18}{m + 6}$$

25) \_\_\_\_\_

Factor out the greatest common factor. Be sure that the coefficient of the term of highest degree is positive.

$$26) 10x^3 - 5x$$

26) \_\_\_\_\_

$$27) 24x^4 + 21x^2$$

27) \_\_\_\_\_

Factor by grouping.

$$28) x^4 - 5x^2 - 24$$

28) \_\_\_\_\_

29)  $5y^6 - 19y^3 + 12$

29) \_\_\_\_\_

30)  $3x^2 - 18x - 15x + 90$

30) \_\_\_\_\_

Factor the polynomial completely. If the polynomial cannot be factored, say it is prime.

31)  $x^2 + x - 56$

31) \_\_\_\_\_

32)  $x^2 + 6x - 16$

32) \_\_\_\_\_

33)  $x^2 - x - 35$

33) \_\_\_\_\_

34)  $a^2 - 2a - 63$

34) \_\_\_\_\_

35)  $7x^2 + 17x - 12$

35) \_\_\_\_\_

36)  $8w^2 + 36w - 20$

36) \_\_\_\_\_

37)  $9x^2 + 13x - 10$

37) \_\_\_\_\_

Factor the polynomial completely.

38)  $x^4 + 10x^2 + 16$

38) \_\_\_\_\_



39)  $2y^6 - 17y^3 + 21$

39) \_\_\_\_\_

40)  $12(a + 3)^2 + 26(a + 3) + 10$

40) \_\_\_\_\_

Factor completely, or state that the trinomial is prime.

41)  $x^2 + 40x + 400$

41) \_\_\_\_\_

42)  $25x^2 - 20x + 4$

42) \_\_\_\_\_

43)  $x^2 - 16xy + 64y^2$

43) \_\_\_\_\_

Factor the difference of two squares completely.

44)  $x^2 - 49$

44) \_\_\_\_\_

45)  $16 - x^2$

45) \_\_\_\_\_

46)  $2x^2 - 18$

46) \_\_\_\_\_

Factor the polynomial completely.

47)  $9x^2 - 42x + 49 - z^2$

47) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

48)  $x^2 + 8x + 16 - x^4$

48) \_\_\_\_\_

A)  $(x - 4 + x^2)(x - 4 - x^2)$

B)  $(x + 4 + x^2)(x + 4 - x^2)$

C)  $(x + 4 - x^2)^2$

D) Prime