

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) $-14a^5$

Answer: Yes; degree 5; monomial

1) _____

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

Answer: Yes; degree 5; polynomial

2) _____

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

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

Find $(f + g)(-2)$.Answer: -3

3) _____

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

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

Answer: $3x^5 + 22x^4 - 10$

4) _____

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

Answer: $8x^2 + 4xy + 11y^2$

5) _____

Find the product.

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

Answer: $-88x^7y^3$

6) _____

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

Answer: $24y^3 - 8y^2$

7) _____

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

Answer: $32a^2x^8 + 40ax^7 - 32a^2x^5$

8) _____

Find the product of the two binomials.

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

Answer: $5x^2 - 31x + 6$

9) _____

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

Answer: $x^2 - 24x + 144$

10) _____

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

Answer: $x^2 + 6xy - 27y^2$

11) _____

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

Answer: $15x^2 + 69x + 36$

12) _____

Find the product of the polynomials.

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

Answer: $a^3 + b^3$

13) _____

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

Answer: $24 - 34p + 19p^2 - 3p^3$

14) _____

Find the special product.

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

Answer: $x^2 - 64$

15) _____

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

Answer: $144 - m^2$

16) _____

17) $(x - 11)^2$

Answer: $x^2 - 22x + 121$

17) _____

18) $(x + 9)^2$

Answer: $x^2 + 18x + 81$

18) _____

Divide and simplify.

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

Answer: $3r^5 - 5r^3$

19) _____

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

Answer: $-3 + \frac{2}{x^2}$

20) _____

Divide using long division.

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

Answer: $x + 8$

21) _____

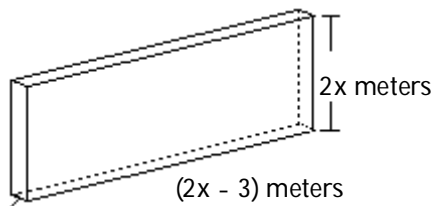
$$22) \frac{15x^3 + 19x^2 - 3x + 14}{-3x - 2}$$

Answer: $-5x^2 - 3x + 3 + \frac{20}{-3x - 2}$

22) _____

Solve the problem.

23)



Width

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.

Answer: $(3x + 2)$ meters

23) _____

Divide using synthetic division.

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

Answer: $5m - 5$

24) _____

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

Answer: $5m^2 - 8m + 3$

25) _____

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

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

Answer: $5x(2x^2 - 1)$

26) _____

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

Answer: $3x^2(8x^2 + 7)$

27) _____

Factor by grouping.

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

Answer: $(x^2 + 3)(x^2 - 8)$

28) _____

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

Answer: $(5y^3 - 4)(y^3 - 3)$

29) _____

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

Answer: $3(x - 6)(x - 5)$

30) _____

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

31) $x^2 + x - 56$

Answer: $(x - 7)(x + 8)$

31) _____

32) $x^2 + 6x - 16$
Answer: $(x + 8)(x - 2)$

32) _____

33) $x^2 - x - 35$
Answer: Prime

33) _____

34) $a^2 - 2a - 63$
Answer: $(a - 9)(a + 7)$

34) _____

35) $7x^2 + 17x - 12$
Answer: $(x + 3)(7x - 4)$

35) _____

36) $8w^2 + 36w - 20$
Answer: $4(2w - 1)(w + 5)$

36) _____

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

Answer: $(x + 2)(9x - 5)$

37) _____

Factor the polynomial completely.

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

Answer: $(x^2 + 2)(x^2 + 8)$

38) _____

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

Answer: $(2y^3 - 3)(y^3 - 7)$

39) _____

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

Answer: $(3a + 14)(4a + 14)$

40) _____

Factor completely, or state that the trinomial is prime.

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

Answer: $(x + 20)^2$

41) _____

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

Answer: $(5x - 2)^2$

42) _____

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

Answer: $(x - 8y)^2$

43) _____

Factor the difference of two squares completely.

44) $x^2 - 49$

Answer: $(x + 7)(x - 7)$

44) _____

45) $16 - x^2$
Answer: $(4 - x)(4 + x)$

45) _____

46) $2x^2 - 18$
Answer: $2(x + 3)(x - 3)$

46) _____

Factor the polynomial completely.

47) $9x^2 - 42x + 49 - z^2$
Answer: $(3x - 7 + z)(3x - 7 - z)$

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) $(x - 4 + x^2)(x - 4 - x^2)$
 - C) $(x + 4 - x^2)^2$
- Answer: B

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