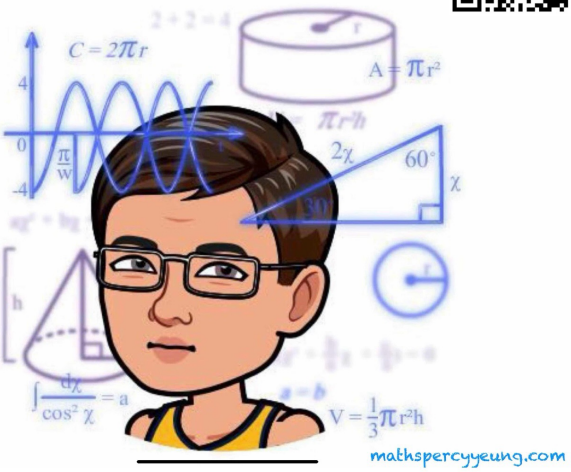


S1

Mathematics

Past Exam Paper (1314–2223)

Question Book

Ch 6 Manipulations of Polynomials

UCCKE F1 Ch6 Manipulations of Polynomials

Ch 6 Manipulations of Polynomials

[1314 S.1 2nd Exam MC Q10]

1. Which of the following are polynomials?

   I. $2x^3+x^2-1$

   II. $2x+3y$

   III. $2+\frac{3}{x}$

   A. I and II

   B. I and III

   C. II and III

   D. I, II and III

[1314 S.1 2nd Exam SQ Q7]

2. Simplify the following expressions. (3 marks)

   (a) $5a^3 \times a^3$

   (b) $(-4x^2y^4) \div (-2xy^2)$

[1314 S.1 2nd Exam SQ Q8]

3. Expand the following expressions. (3 marks)

   (a) $(4x+2)-(-x+8)$

   (b) $(a-b+c)(2a)$

   (c) $(2x+y)^2$

[1314 S.1 2nd Exam Enhanced Question Q2]

4. Daniel has \$$(5x-1)$, Ronald has \$$(3x^2+x-4)$ and Stephen has \$$(8x^2-3x)$.
   (a) Express the total amount of money they have in terms of x.
   (b) Hence, find the total amount when $x = 10$. (4 marks)

[1415 S.1 2nd Exam MC Q3]

5. $3^x \cdot 5^x =$

   A. 8^x. B. 8^{2x}. **C.** 15^x. D. 15^{2x}.

[1415 S.1 2nd Exam MC Q4]

6. Find the degree of the polynomial $1-5y^3+3y-y^4+7y^2$.

   A. 5 B. 4 C. 9 **D.** 10

[1415 S.1 2nd Exam MC Q5]

7. Which of the following is a monomial?

   A. $x+1$ **B.** $-\frac{x^3}{5}$ C. $\frac{2}{x+1}$ **D.** x^2+2x-5

[1415 S.1 2nd Exam MC Q6]

8. $4+8x=$

   A. $12x$. B. $8+4x$. C. $4+8+x$. **D.** $4+4x+4x$.

[1415 S.1 2nd Exam SQ Q3]

9. Simplify the expression $2x^2 \times 3x^3$. (2 marks)

[1415 S.1 2nd Exam SQ Q4]

10. Simplify the expression $\left(\frac{a}{2a^3}\right)^3$. (2 marks)

[1415 S.1 2nd Exam SQ Q5]

11. Simplify the following expression and express the answer in descending powers of x.

$(3-x+2x^2)-(x+3x^2-4)$

(3 marks)

[1415 S.1 2nd Exam Enhanced Question Q2]

12. (a) Expand $(x-2)^2$. (2 marks)

(b) Hence, expand $(x-2)^3$. (3 marks)

Bonus part:

(c) Peter thinks that $(a-b)^3 = a^3 - b^3$ for all values of a and b. Is he correct? Explain your answer.

(1 mark)

[1516 S.1 2nd Exam MC Q1]

13. $-(2x)^4 =$

A. $2x^4$. **B.** $-2x^4$. **C.** $16x^4$. **D.** $-16x^4$.

[1516 S.1 2nd Exam MC Q2]

14. Which of the following polynomials is arranged in ascending powers of y?

A. $13 - 5xy^4 + 2x^2y - 24x^3y^3 + 17x^4y^2$

B. $13 + 2x^2y + 17x^4y^2 - 24x^3y^3 - 5xy^4$

C. $17x^4y^2 - 24x^3y^3 - 5xy^4 + 2x^2y^5 + 14$

D. $-5xy^4 - 24x^3y^3 + 17x^4y^2 + 2x^2y + 13$

[1516 S.1 2nd Exam SQ Q1]

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

[1516 S.1 2nd Exam SQ Q2]

16. Expand $(2x-5y)(x+4y)$. (3 marks)

[1617 S.1 2nd Exam MC Q1]

17. Which of the following is NOT true about the polynomial $-5+4x+8x^3$?

A. The coefficient of x^3 is 8.

B. It is arranged in ascending powers of x.

C. The constant term is -5.

D. The degree of the polynomial is 4.

[1617 S.1 2nd Exam MC Q6]

18. What are the coefficient of x^2 and the constant term in $(x-5)(x^2-x+2)$?

	Coefficient of x^2	Constant term
A.	6	10
B.	-6	10
C.	-6	-10
D.	-5	-10

[1617 S.1 2nd Exam SQ Q11]

19. Simplify $(2x+3)-(4x-5)$. (2 marks)

[1617 S.1 2nd Exam SQ Q12]

20. (a) Simplify $(2b^2)^3$. (1 mark)

(b) Simplify $\dfrac{(-x^2y)^4}{2x^5y^9}$ and give your answer with positive indices. (3 marks)

[1718 S.1 2nd Exam MC Q2]

21. The degree of the polynomial $2a^2b+3bc-a^2b^2c+4$ is

A. 5.
B. 4.
C. 3.
D. 2.

[1718 S.1 2nd Exam MC Q3]

22. Simplify $3x^{10}\div(6x^2\times 2x^5)$.

A. 1
B. $\dfrac{1}{4}$
C. $4x^3$
D. $\dfrac{1}{4}x^3$

[1718 S.1 2nd Exam FQ Q11]

23. Simplify the following expressions.

(a) $4r - s + 3r - 11s$

(b) $(2x - 5y) - (4x - 6y)$

(3 marks)

[1718 S.1 2nd Exam FQ Q12]

24. Expand the following expressions.

(a) $\left(-x^2y\right)^2$

(b) $\left(y+1\right)^2$

(4 marks)

[1819 S.1 2nd Exam MC Q5]

25. $\left(-\frac{3x^5y^2}{xy^4}\right)^2 =$

A. $-6x^9$.

B. $-\frac{3x^8}{y^4}$.

C. $\frac{9x^8}{y^4}$.

D. $\frac{9x^2}{y}$.

[1819 S.1 2nd Exam MC Q6]

26. Which of the following is **NOT** true about the polynomial $1+2ab^6-7a^4b^2-5a^2b^3$?

A. The degree of the polynomial is 7.

B. The constant term is 1.

C. The number of terms of the polynomial is 4.

D. The coefficient of a^4b^2 is 7.

[1819 S.1 2nd Exam BQ Q16]

27. Simplify $(2x+y-4z)-(z-y-x)$. (2 marks)

[1819 S.1 2nd Exam BQ Q17]

28. Expand $(y-5)^2$ and arrange the terms in descending powers of y. (2 marks)

[1819 S.1 2nd Exam BQ Q18]

29. Expand $(3x-2)(4x+1)$ and arrange the terms in descending powers of x. (2 marks)

[1819 S.1 2nd Exam IQ Q24]

30. Solve $\frac{x+1}{3}-\frac{x-2}{2}=1$. (3 marks)

[1819 S.1 2nd Exam AQ Q29]

31. (a) Simplify $(x+y)(x-y)$. (1 mark)

(b) By using the result of (a), simplify

$(a^2+b^2)(a^2-b^2)+(b^2+c^2)(b^2-c^2)+(c^2+a^2)(c^2-a^2)$.

(2 marks)

[1920 S.1 Exam MC Q9]

32. In the polynomial $15-xy^5-4x^5+x^4$, the degree is

A. 4.

B. 5.

C. 6.

D. 15.

[1920 S.1 Exam BQ Q3]

33. Expand $(6x+5)(3x+2)$. (3 marks)

[2021 S.1 WSUT MC Q2]

34. Which of the following is a polynomial?

A. $x^{\frac{1}{2}}-3$

B. 2^x+7

C. $\frac{2}{x+1}$

D. x^2+2x-5

[2021 S.1 WSUT MC Q3]

35. The degree of the polynomial $5 + 3x^4y + 6xy^2 - x^2y$ is

A. 11.

B. 8.

C. 5.

D. 4.

[2021 S.1 WSUT MC Q4]

36. The value of the polynomial $-2x^3 + 3x^2 - 2x + 5$ is the largest when $x =$

A. 3.

B. 5.

C. –3.

D. –5.

[2021 S.1 WSUT MC Q5]

37. If n is a positive integer, $6^n \cdot 9^n =$

A. 54^{2n}.

B. 15^{2n}.

C. $2^n \cdot 3^{3n}$.

D. 54^{n^2}.

[2021 S.1 WSUT BQ Q12]

38. Simplify each of the following expressions and express your answers with positive indices.

(a) $ab^4 \times a^5b^7$

(b) $x^4y^8 \div (xy^9)$

(c) $\left(-m^4\right)^2$

(3 marks)

[2021 S.1 WSUT IQ Q17]

39. (a) Simplify $\dfrac{\left(-4a^2b^4\right)^2}{\left(2ab^5\right)^3}$ and express your answer with positive indices. (2 marks)

(b) Simplify $(2a-b)^2-2(-7a^2+ab-3b^2)$ and arrange the terms in descending powers of a. (3 marks)

[2021 S.1 WSUT AQ Q20]

40. (a) Expand $\left(x^2-2x-8\right)\left(x^2+3x-7\right)$. (2 marks)

(b) Using the result of (a), expand $\left(y^4+2y^2-8\right)\left(y^4-3y^2-7\right)$. (3 marks)

[2021 S.1 Final Exam BQ Q4]

41. (a) Simplify $(2x-1)(x+2)+(x-2)$. (2 marks)

(b) Simplify $\left(-2m^3\right)^2$. (2 marks)

[2021 S.1 Final Exam MC Q5]

42. If $n > 1$, which of the following must be true?

I. $n4 + n4 = n8$

II. $\frac{n^9}{n^3} = n6$

III. $(n8)2 = n16$

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

[2021 S.1 Final Exam MC Q6]

43. $2^{555} \cdot 4^{222} =$

A. 2^{999}.

B. 6^{777}.

C. 8^{777}.

D. 8^{123210}.

[2122 S.1 WSUT MC Q1]

44. In the polynomial $4x^2y-3x+x^2-y-5yx^2-3$, which of the following terms are like terms?

A. $4x^2y$ and $-5yx^2$

B. $-3x$ and x^2

C. $-3x$ and -3

D. $-y$ and -3

[2122 S.1 WSUT MC Q5]

45. Which of the following statements about the polynomial $3ab+4a^2-5$ is true?

I. The degree of the polynomial is 2.

II. The constant term is 5.

III. It is a binomial.

A. I only

B. II only

C. I and III only

D. II and III only

[2122 S.1 WSUT MC Q6]

46. Write $-5b^2+2b+3b^3-b^4-15$ in ascending powers of b.

A. $2b-5b^2+3b^3-b^4-15$

B. $-15+2b+5b^2-3b^3-b^4$

C. $-b^4+3b^3-5b^2+2b-15$

D. $-15+2b-5b^2+3b^3-b^4$

[2122 S.1 WSUT MC Q8]

47. Let $y=-x^2+kx-9$, where k is a constant. When $x=-2$, $y=-25$. Find the value of k.

A. -10

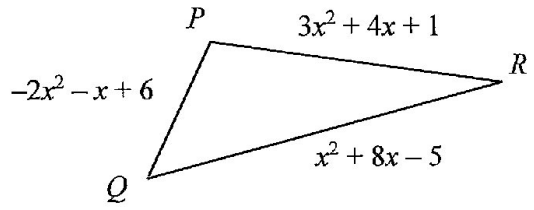
B. -6

C. 6

D. 10

48. [2122 S.1 WSUT BQ Q11]

Find the perimeter of the following figure in terms of x.
Express your answer in descending powers of x. (2 marks)



49. [2122 S.1 WSUT BQ Q12]

Simplify each of the following expressions and express your answers with positive indices.

(a) $p^7q^2 \div p^3q^5$ (2 marks)

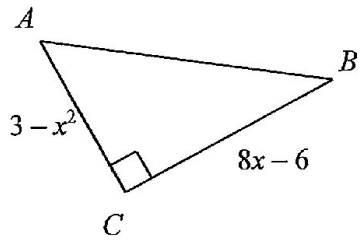
(b) $(2r^3)^4$ (2 marks)

50. [2122 S.1 WSUT IQ Q16]

Simplify $\left(\frac{-3x^4y^5}{x^7}\right)^3$ and express your answer with positive indices. (3 marks)

51. [2022 S.1 WSUT IQ Q19]

Given a triangle where $\angle ACB = 90°$, $BC = 8x - 6$ and $AC = 3 - x^2$.



(a) Expand and simplify the expression for the area of ΔABC in terms of x. (3 marks)

(b) If $x = 1$, show that ΔABC is an isosceles triangle. (1 mark)

52. [2122 S.1 Final Exam BQ Q2]

Simplify $\dfrac{m^{13}n^8}{(m^3n^4)^3}$ and express your answer with positive indices. (2 marks)

53. [2122 S.1 Final Exam BQ Q4]

Expand $(4y - 5)(1 - 2y)$ and express your answer in descending power of y. (2 marks)

54. [2122 S.1 Final Exam MC Q2]

$(2b)^2 + 2b^2 =$

A. $4b^2$.

B. $6b^2$.

C. $4b^4$.

D. $6b^4$.

55. [2122 S.1 Final Exam MC Q4]

Which of the following statement is true?

I. $2x + 3y = 5xy$

II. $(-3y)^2 = 9y^2$

III. $(3 + y)^2 = 9 + y^2$

A. I only

B. II only

C. I and III only

D. II and III only

56. [2223 S.1 WSUT MC Q1]

$uv \times (-u) \times v^2 \times (-v^3) =$

A. $-u^2v^7$.

B. u^2v^7.

C. $-u^2v^6$.

D. u^2v^6.

57. [2223 S.1 WSUT MC Q6]

$4q - (6q - 5)(3q) =$

A. $-6q^2 + 15q$.

B. $-18q^2 + 19q$.

C. $-18q^2 + 4q + 5$.

D. $-6q^2 + 5$.

58. [2223 S.1 WSUT MC Q9]

The length and the width of a rectangular sheet are $(3x + 5)$ cm and $(2x - 1)$ cm respectively. If a square with the largest area is cut away from the sheet, find the area of the remaining part.

A. $(-3x^2 - 23x - 30)$ cm^2

B. $(2x^2 + 7x - 6)$ cm^2

C. $(2x^2 + 11x - 6)$ cm^2

D. $(-3x^2 + 7x - 30)$ cm^2

59. [2223 S.1 WSUT BQ Q11]

Consider the polynomial $4 + 3y^4 - 8xy^5 - 10x^2y - 6x^4y^3$.

(a) Write down the coefficient of the term x^2y and the degree of the polynomial. (2 marks)

(b) Arrange the terms of the polynomial in ascending powers of y. (1 mark)

(c) Find the value of the polynomial when $x = 2$ and $y = -3$. (2 marks)

60. [2223 S.1 WSUT BQ Q12]

(a) Simplify $3x^4 - 2x^3 - 5x^2 - 2 - 4x^4 + 2x^2 + 1$. (2 marks)

(b) Expand $(-x^2)(-5x - 7y)$. (2 marks)

61. [2223 S.1 WSUT IQ Q17]

Simplify $\left(\frac{p^2}{2q^3}\right)^2 (8p^8q^7)$. (4 marks)

62. [2223 S.1 Final Exam MC Q12]

If $x \neq 0$, which of the following must be true?

A. $(x^4)^2 = x^{16}$

B. $x^5 \times x^2 = x^{10}$

C. $\frac{x^{16}}{x^4} = x^4$

D. $x^{12} \div x^2 = x^{10}$