TB(1B) Ch. 12 Manipulation of Simple Polynomials

Conventional Questions

1. **[11-12 Standardized Test, 1]**

Simplify $\dfrac{a^2 \times (-b)^4}{b^2} \times a^3$. **(3 marks)**

2. **[11-12 Standardized Test, 7]**

Some candies are shared among 3 children. Athena gets $2y^3 - 3y^2 + 4y - 1$ candies, Betty gets $9y - 3y^2 - 1$ candies and Cindy gets the remaining candies. Express the results of the following in ascending powers of y.

    (a) Find the total number of candies that Athena and Betty get. **(3 marks)**

    (b) If the original number of candies is $4y + 2y^3 + 1$, find the number of candies Cindy gets.

    (4 marks)

    (c) If $y = 2$, find the number of candies Cindy gets. **(2 marks)**

3. **[11-12 Mid-year Exam, 5]**

Expand and simplify $10(4r - 3)(r^2 + 1) - 8(5r - 2)$, and arrange the terms in ascending powers of r.

(4 marks)

4. **[11-12 Mid-year Exam, 8]**

Find the value of the polynomial $9x^2 - 2xy + 4y^2$ when $x = -\dfrac{1}{3}$ and $y = 4$. **(3 marks)**

5. **[12-13 Standardized Test 1]**

Consider the formula $S = c - ab^2$, find the value of S if $a = -0.25$, $b = -2$ and $c = 4$.

6. **[12-13 Mid-year 2]**

Simplify $3a^{33} \times 2a^{10} + a^{55} \div 2a^{12}$. **(2 marks)**

7. **[12-13 Mid-year 4]**

Simplify the following expressions.

    (a) $8x^5 \div 2x^2 \div 2x$ **(2 marks)**

    (b) $3^{k+2} \times \left(-3^{k-1}\right) \div 3^{k-2}$ **(2 marks)**

8. **[12-13 Mid-year 5]**

Expand and simplify the following expressions, and arrange the terms in descending powers of x.

    (a) $(4x - x^2) - (x^2 - 3 + 3x)$ **(2 marks)**

    (b) $2(x - 2)(x - 3)$ **(2 marks)**

9. **[12-13 Final Exam 9]**

   The selling price of an apple is $\$(px+1)$, where p is a constant. Angel wants to buy $(x^2 - x + 1)$ apples.

   (a) How much should Angel pay for the apples? Expand and simplify the expression.

   (2 marks)

   (b) If the sum of the coefficients of x^3, x^2 and x in the result obtained in **(a)** is 1, find the value of p.

   (2 marks)

10. **[13-14 Final Exam 6]**

    Expand $(2 + 3x)(4 - 2x + 3x^2)$ and express the answer in descending powers of x.   **(3 marks)**

11. **[13-14 Mid-year Exam]**

    Simplify $\dfrac{7^{5a+3}}{7^{2a-2}} \times (-7)$.   **(2 marks)**

12. **[14-15 Mid-year Exam]**

    (a) Expand $(3x - 2)(4x + 5)$.   **(2 marks)**

    (b) Using the result of **(a)**, or otherwise, expand $(3x - 2)(2x - 1)(4x + 5)$ and arrange the answer in ascending powers of x.   **(3 marks)**

13. **[14-15 Mid-year Exam]**

    (a) Find the value of the polynomial $2x^2 - 4x$ when $x = 5$.   **(2 marks)**

    (b) Find the value of A in the formula $A = \dfrac{3(h^2 + 4k^3)}{10k}$ when $h = -4$ and $k = -\dfrac{3}{2}$. **(3 marks)**

14. **[15-16 Mid-year Exam]**

    (a) Expand and simplify $(10a + 5)^2$ and $100a(a + 1) + 25$. Are their results the same?   **(2 mark)**

    (b) It is given that an integer ending with 5 can be expressed in the form of $(10a + 5)$ where a is an integer. For example, $15 = 10 \times 1 + 5$, $25 = 10 \times 2 + 5$, etc. Use the result of **(a)** and by substituting a suitable value of a, find 995^2.   **(3 marks)**

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