

TB(1A) Ch. 3 Introduction to Algebra

Conventional Questions

1. [16-17 Mid-year Exam, #4]
It is given that $S = a^2 + ab$. When $a = 2$ and $b = -5$, find the value of S . (2 marks)

2. [16-17 Mid-year Exam, #5]
Simplify $-2x + 5y + 7xy - 6y + 3x - 9xy$. (2 marks)

3. [16-17 Final Exam, #1]
Write down the result of the algebraic expression in each of the following. (2 marks)
 - (a) Amy has x candies. John has 15 candies less than twice that of Amy.
John has _____ candies.
 - (b) Multiply c by the sum of a and b , the product is _____.

4. [16-17 Final Exam, #2]
Given the formula $M = \frac{b - a^2}{2b}$, find the value of M if $a = -1$ and $b = 2$. (2 marks)

5. [17-18 Standardized Test #4]
 - (a) Simplify $\frac{-12x^6}{4x^3 \times 8x^2}$. (2 marks)
 - (b) Simplify $(-6x)^2 \div (-2x) \div (-3x)$. (2 marks)

6. [17-18 Standardized Test #5]
Consider the formula $F = \frac{5}{b^2 - a}$. If $a = -1$ and $b = -3$, find the value of F by the method of substitution. (2 marks)

7. [17-18 Mid-year Exam, #7]
It is given that the general term of a number sequence is $T_n = (1 + 2n - 1) \times n \div 2$.
 - (a) Simplify T_n . (1 mark)
 - (b) Write down the first 3 terms of the sequence. (1 mark)
 - (c) What kind of sequence is it? (1 mark)

8. [17-18 Mid-year Exam, #8]
Consider the formula $s = \frac{v^2 - u^2}{2a}$. Find the value of s when $a = 5$, $u = -2$ and $v = 2$.

(2 marks)

9. [17-18 Final Exam, #1]

(a) Simplify $4a^3 \times 3a^2 \div 2a - a$.

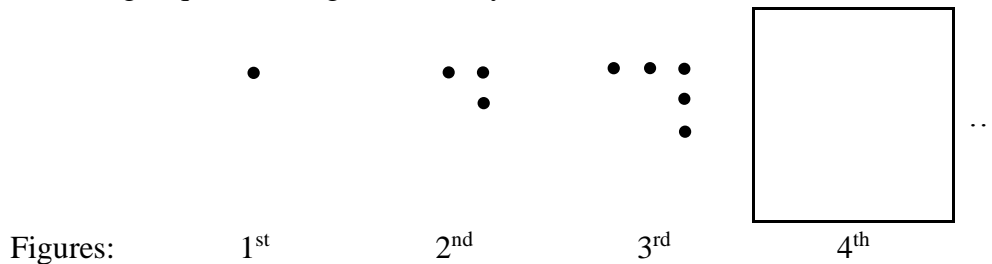
(1 mark)

(b) Hence, find the value of the polynomial in (a) when $a = -2$.

(2 marks)

10. [17-18 Final Exam, #2]

The following sequence of figures form by the dots.



(a) Draw the 4th figure of the sequence in the box above.

(1 mark)

(b) Write down the number of dots in the 8th figure.

(1 mark)

11. [18-19 Standardized Test #5]

A pen cost \$ x . A rubber is \$3 cheaper than the pen.

(a) Express the total cost of a dozen of rubbers in terms of x .

(1 mark)

12. [18-19 Standardized Test #8]

The sum S of the first n consecutive positive multiple of 3 (i.e. 3, 6, 9, ..., $3n$) is given by

$$S = \frac{3n(n+1)}{2}.$$

(a) By using a correct substitution into the formula, find $3 + 6 + 9 + \dots + 300$.

(2 marks)

(b) Hence find $183 + 186 + 189 + \dots + 300$. (Level 3)

(2 marks)

13. [18-19 Mid-year Exam, #9]

(a) Simplify $a + 2a(a + 2a)$.

(2 marks)

(b) Simplify $(2a - a) \div (a + 2a)$

(2 marks)

(c) When $a = -1$, find the value of the expression $\frac{(2a - a) \div (a + 2a)}{a + 2a(a + 2a)}$.

(2 marks)

14. [18-19 Final Exam, #1(a)(b)]

(a) It is given that $a = b^2 + c^2 - 2bc$. When $b = 2$ and $c = -1$, find the value of a .

(2 marks)

(b) Simplify $4a^3b \div a - 2a \times 7ab$.

(2 marks)

15. [19-20 Standardized test, #4]

Simplify $6x \div 2 - 4y \div 8 - x$.

(2 marks)

16. [19-20 Standardized test, #8]

(a) Simplify $6hk + k^2 + 4kh - 15hk - 3k^2$.

(2 marks)

(b) Simplify $42b^3c^4 \div (14b^4c^8 \div 21b^2c^3)$ and express your answer with positive indices.

(3 marks)

17. [19-20 Mid-year Exam, #3]

Express the following word phrase with an algebraic expression:

“Multiply 5 times of m by the sum of $4n$ and 3”.

(1 mark)

18. [19-20 Mid-year Exam, #4]

Simplify the expression $a \times 4b - b \times a$.

(1 mark)

19. [19-20 Mid-year Exam, #8]

Simplify the expression $3p^3q^4 \div (5p^2q^6)$. Express your answer with positive indices.

(2 marks)

20. [19-20 Mid-year Exam, #9]

(a) Expand $4p(p^2 - 2)$.

(1 mark)

(b) Simplify $(2a^2 - 3a + 1) - 3(2a + 3 - a^2)$ and arrange the terms in ascending powers of a .

(3 marks)

21. [19-20 Mid-year Exam, #10]

It is given the formula $A = \frac{x}{3} - (a+b)^3$. Find the value of A if $x = -3$, $a = -1$ and $b = -2$.

(3 marks)

22. [19-20 Mid-year Exam, #12]

Simplify $2y - 4x + 3\left(\frac{6x - 2y}{5}\right)$.

(3 marks)

23. [20-21 Mid-year, #9]

The general term of a sequence is $a_n = 7n + 6$. The k^{th} term of the sequence is 90.

Find the value of k .

(2 marks)

24. [20-21 Final Exam, #4]

Simplify $12a - 4b \div 2 - 8 \times 2a + 3b$.

(2 marks)

25. [20-21 Final Exam #16]

The general term of a sequence is $a_n = \frac{3n+k}{n}$.

If the 4th term of the sequence is 2, find the value of k .

(2 marks)

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