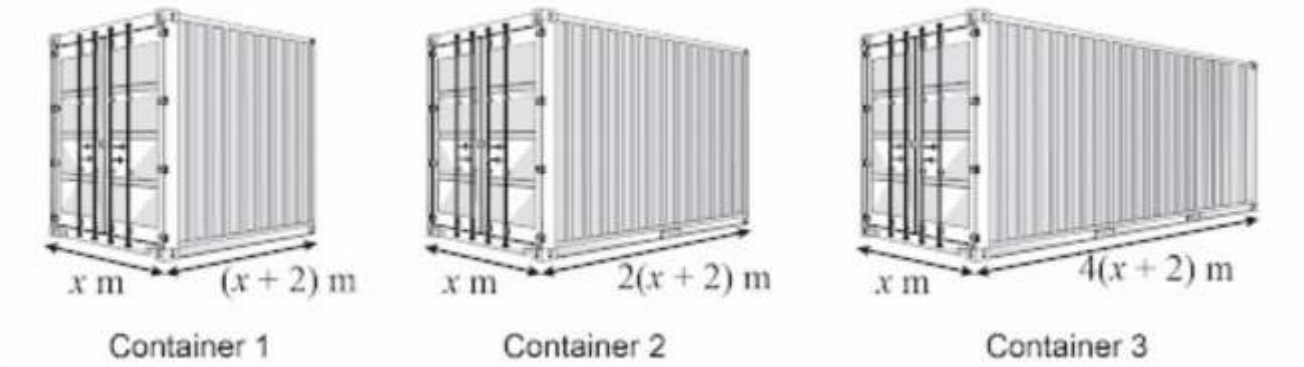
केंद्रीय माध्यमिक शिक्षा बोर्ड
CENTRAL BOARD OF SECONDARY EDUCATION

Curriculum Aligned Competency Based Test Items
Mathematics
Class 9 – Chapter 2
Polynomials

A shipment service provider uses three types of containers for shipping materials. The height and width of the three containers are the same. The containers' height is 0.15 m more than their width, and the volume of the smallest container is 652 m^3



SAS21M09C0201

1 Write a polynomial relating Container 1's length, breadth and height with its volume.

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SAS21M09C0202

2 Which of the following statements is true?

A. The volume of the three containers is the same.
B. The length of the three containers is the same.
C. The volume of Container 3 is 2,608 m^3.
D. The length of Container 3 is 4 times the length of Container 2.

SAS21M09C0203

3 What is the height of each container?

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Hard plastic square shaped sheets are available in the.
The side length of sheets is as per requirement.
The price of a sheet is z per square meter.
Anuj requires two sheets – a smaller sheet with side length x m and a larger sheet with side length y m. He has two choices:
Choice 1 – buy two separate sheets of side lengths x m and y m
Choice 2 – buy a single sheet with side length $(x + y)$ m

SAS21M09C0204

4 What is the height of each container?

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SAS21M09C0205

5 What is the difference in price between the two choices?

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SAS21M09C0206

6 The area of a rectangle is $(3x^2 + x - 2)$ square units. Its width is $(1 + x)$ units. What is the length of the rectangle?

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SAS21M09C0207

7 A polynomial is expressed as $x^3 + bx^2 + cx + d = 0$. The same polynomial can be written in factor form as $x + px + qx + r = 0$.
How is the constant term in the polynomial related to its factors p, q, and r?

A. $d = p + q + r$
B. $d = (p + q) \times r$
C. $d = p \times q \times r$
D. $d = pq + qr + pr$

SAS21M09C0208

8 A polynomial is divided by $(x-1)$. The quotient obtained is $3x^3 - x^2 - x - 4$, and the remainder is -5. Which polynomial meets these conditions?

A. $3x^3 - x^2 - x - 9$
B. $3x^3 - x^2 - x - 4$
C. $3x^4 - 4x^3 - 3x + 4$
D. $3x^4 - 4x^2 - 3x - 1$

SAS21M09C0209

9 What is the common factor of $x^3 - x^2$ and $-22x^2 + 142x - 120$?

A. x
B. $(x-1)$
C. x^2
D. 1

SAS21M09C0210

10 A polynomial is expressed as: $p(x) = x^3 + x^2 - x - 1$
At what values of x is the polynomial $p(x) = 0$?

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Answers

Item Number	
Question Code	SAS21M09C0201
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Geometrical Representation)
Competency	Formulate
Item Type	Closed Constructed Response
Full Credit (Full Score)	Writes an equation relating length, breadth, height and volume. • $x^3 + 2.15x^2 + 0.3x = 652$ • $x^3 + 2.15x^2 + 0.3x - 652 = 0$ • $x(x + 2)(x + 0.15) = 652$ • $x(x + 2)(x + 0.15) - 652 = 0$
No Credit (No Score)	Any other response or missing response

Item Number	Question 2
Question Code	SAS21M09C0202
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Factorisation of Polynomials)
Competency	Interpret & Evaluate
Item Type	Multiple Choice Question
Full Credit (Full Score)	C. The volume of Container 3 is 2608 m^3.
No Credit (No Score)	Any other response or missing response

Item Number	Question 3
Question Code	SAS21M09C0203
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Factorisation of Polynomials)
Competency	Employ
Item Type	Closed Constructed Response
Full Credit (Full Score)	Write 8.15 with or without the Chapter • 8.15 m • 8.15
No Credit (No Score)	Any other response or missing response

Item Number	Question 4
Question Code	SAS21M09C0204
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Geometrical Representation)
Competency	Formulate
Item Type	Closed Constructed Response
Full Credit (Full Score)	Mentions Choice 1 OR 1
No Credit (No Score)	Any other response or missing response

Item Number	Question 5
Question Code	SAS21M09C0205
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Factorisation of Polynomials)
Competency	Employ
Item Type	Closed Constructed Response
Full Credit (Full Score)	Writes 2 $x\ y\ z$ with or without the word 'units' • 2 $x\ y\ z$ • 2 $x\ y\ z$ units
No Credit (No Score)	Any other response or missing response

Item Number	Question 6
Question Code	SAS21M09C0206
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Factorisation of Polynomials)
Competency	Interpret & Evaluate
Item Type	Closed Constructed Response
Full Credit (Full Score)	Writes $3x - 2$ with or without the word 'units' • $3x - 2$ units • $3x - 2$
No Credit (No Score)	Any other response or missing response

Item Number	Question 7
Question Code	SAS21M09C0207
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Geometrical Representation)
Competency	Formulate
Item Type	Multiple Choice Question
Full Credit (Full Score)	C. $d = p \times q \times r$
No Credit (No Score)	Any other response or missing response

Item Number	Question 8
Question Code	SAS21M09C0208
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Factorisation of Polynomials)
Competency	Interpret & Evaluate
Item Type	Multiple Choice Question
Full Credit (Full Score)	D. $3x^4 - 4x^3 - 3x - 1$
No Credit (No Score)	Any other response or missing response

Item Number	Question 9
Question Code	SAS21M09C0209
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Factorisation of Polynomials)
Competency	Employ
Item Type	Multiple Choice Question
Full Credit (Full Score)	B. $(x - 1)$
No Credit (No Score)	Any other response or missing response

Item Number	Question 10
Question Code	SAS21M09C0210
Grade & Chapter Name	Grade 9 | Polynomials
Concept | Sub-concept	Algebra | Algebraic Expressions and Identities (Geometrical Representation)
Competency	Employ
Item Type	Closed Constructed Response
Full Credit (Full Score)	Writes 1 and –1
Partial Credit (Partial Score)	Writes either 1 OR – 1
No Credit (No Score)	Any other response or missing response