

SUMMATIVE QUIZ IN MATHEMATICS 10
School Year 2025 - 2026

Name: _____

Date: _____

Grade & Section: _____

Teacher: _____

I. MULTIPLE CHOICE (1-20)

Directions: Read each question carefully. Choose the letter of the correct answer by typing the letter of your choice in the space provided before the number. Type E if the answer is not among the options.

_____ 1. It is an expression in the form $a_n x^n + a_{n-1} x^{n-1} + \dots + a_2 x^2 + a_1 x + a_0$ consisting of one or more terms containing variables with nonnegative integer exponents.

- | | |
|--------------------------|-----------------------------|
| A. Algebraic Expression | C. Logarithmic Expression |
| B. Polynomial Expression | D. Trigonometric Expression |

_____ 2. What is the degree of the polynomial $4x^5 - 2x^3 + 7x - 9$?

- | | |
|--------------------|--------------------|
| A. 1 st | C. 5 th |
| B. 3 rd | D. 9 th |

_____ 3. What is the leading coefficient of the polynomial $3x^4 - 5x^2 + 2x + 1$?

- | | |
|-------|------|
| A. -5 | C. 2 |
| B. 1 | D. 3 |

_____ 4. When the polynomial $P(x) = x^3 - 4x^2 + 3x - 12$ is divided by $x - 4$, which part of the division algorithm represents the remainder?

- | | |
|-----------------|-------------------------------|
| A. The Divisor | C. The Degree of the Quotient |
| B. The Quotient | D. A constant term |

_____ 5. When performing polynomial long division, which step is crucial to ensure accuracy?

- A. Write terms in ascending order.
B. Multiply the divisor by a term to eliminate the constant term of the dividend.
C. Multiply the divisor by a term to eliminate the leading term of the current dividend.
D. Only divide the first term of the dividend.

_____ 6. Which statement is true about synthetic division?

- A. It can be used to divide by any polynomial divisor.
B. It only works when the divisor is of the form $x - a$.
C. It provides both the quotient and remainder, but only for cubic dividends.
D. It is a method used to find the degree of a polynomial.

_____ 7. If the remainder when dividing a polynomial $P(x)$ by $x + 4$ is 0, which of the following is true?

- | | |
|---------------|-------------------------------|
| A. $P(4) = 0$ | C. $P(-4) = 0$ |
| B. $P(0) = 4$ | D. The degree of $P(x)$ is 4. |

_____ 8. Which of the following best describes the Factor Theorem?

- | | |
|---|---|
| A. If $P(a) = 0$, then $x - a$ is a factor of $P(x)$. | C. It finds the remainder of any division. |
| B. If $x - a$ is a factor, then $P(a) = 1$. | D. It is used to determine the leading coefficient. |

_____ 9. If $P(x)$ is divisible by $(x + 2)$, which of the following must be true?

- | | |
|----------------|-------------------------------------|
| A. $P(2) = 0$ | C. $P(0) = -2$ |
| B. $P(-2) = 0$ | D. The sum of the coefficients is 0 |

_____ 10. Which of the following is a factor of $x^3 - 2x^2 - 5x + 6$?

- | | |
|------------|------------|
| A. $x - 1$ | C. $x - 4$ |
| B. $x + 2$ | D. $x + 5$ |

____ 11. A polynomial function has roots/zeros at $-3, 1, 2$. Which of the following could be the polynomial?

- A. $x(x-3)(x+2)$ C. $(x+3)(x)(x+2)$
 B. $(x+3)(x-1)(x-2)$ D. $(x-3)(x+1)(x+2)$

____ 12. According to the Rational Root Theorem, the possible rational roots of $P(x) = 3x^3 - 4x^2 + 2x - 9$ are of the forms:

- A. $\pm \frac{p}{q}$ where p is a factor of 9 and q is a factor of 3.
 B. $\pm \frac{p}{q}$ where p is a factor of 3 and q is a factor of 9.
 C. $\pm 1, \pm 3, \pm 9$
 D. $\pm 1, \pm 2, \pm 3, \pm 9$

____ 13. What are the possible rational roots of $P(x) = 2x^3 - x^2 - 4x + 2$?

- A. $\pm 1, \pm 2$ C. $\pm 1, \pm \frac{1}{2}$
 B. $\pm 1, \pm 2, \pm \frac{1}{2}$ D. $\pm 2, \pm \frac{1}{2}$

____ 14. Which number is a possible rational root of $6x^4 + 5x^3 - 3x^2 + 2x - 1 = 0$?

- A. -3 C. $\frac{2}{5}$
 B. $\frac{1}{3}$ D. $\frac{3}{2}$

____ 15. A student uses synthetic division to test if $x = 2$ is a root of $P(x) = x^3 - 6x^2 + 11x - 6$. Using synthetic division, the last number in the bottom row is zero. What is the correct conclusion?

- A. $x = 2$ is not a root. C. The polynomial has no real roots.
 B. $x = 2$ is a zero, and $x - 2$ is a factor D. The student must use long division instead.

For item 16-20, consider the synthetic division setup below.

$$\begin{array}{r|rrrr} 2 & 1 & -2 & -5 & 6 \\ + & & 2 & 0 & -10 \\ \hline & 1 & 0 & -5 & -4 \end{array}$$

____ 16. Which expression represents the dividend?

- A. $x^4 - 2x^3 - 5x^2 + 6x$ C. $x^3 - 2x^2 - 5x + 6$
 B. $x^2 - 5$ D. $-\frac{4}{x-2}$

____ 17. What is the divisor used?

- A. $x + 2$ C. $x^3 - 2x^2 - 5x + 6$
 B. $x - 2$ D. $x^2 - 5$

____ 18. What is the remainder?

- A. 1 C. -5
 B. 2 D. -4

____ 19. What is the degree of the quotient?

- A. 1 C. 3
 B. 2 D. 4

____ 20. What is the quotient?

- A. $x^4 - 2x^3 - 5x^2 + 6x$ C. $x^3 - 2x^2 - 5x + 6$
 B. $x^2 - 5$ D. $-\frac{4}{x-2}$

II. FILL IN THE BLANKS (20 points)

A. Directions: Fill in the missing parts to complete the solution for each division problem.

Division Algorithm (6 points)

$$P(x) = 2x^3 + 3x^2 - 5x - 7$$

$$D(x) = x + 1$$

$$\begin{array}{r}
 2x^2 + \boxed{} - \boxed{} \\
 x + 1 \overline{) 2x^3 + 3x^2 - 5x - 7} \\
 \underline{- 2x^3 + \boxed{}x^2} \\
 \boxed{}x^2 - \boxed{} \\
 \underline{- x^2 + x} \\
 \phantom{- x^2 + } \boxed{}x - 7 \\
 \phantom{- x^2 + } \underline{- 6x - 6} \\
 \phantom{- x^2 + } \phantom{- 6x - } \boxed{}
 \end{array}$$

Synthetic Division (6 points)

$$P(x) = x^2 - 5x^3 + 7$$

$$D(x) = x + 2$$

$$\begin{array}{r|rrrr}
 -2 & \boxed{} & 1 & \boxed{} & 7 \\
 + & & \boxed{} & -22 & \boxed{} \\
 \hline
 & \boxed{} & 11 & \boxed{} & 51
 \end{array}$$

B. Directions: Use the Rational Root Theorem to complete the step-by-step process. Fill in all missing values.

Using the Rational Root Theorem, list all possible rational roots of the polynomial $P(x) = x^3 - x^2 - 10x - 8$.

- a) The Constant Term a_0 : $\boxed{}$
- b) The Leading Coefficient a_n : $\boxed{}$
- c) Possible Rational Roots:

q \ p	± 1	$\pm \boxed{}$	$\pm \boxed{}$	± 8
± 1	± 1	$\pm \boxed{}$	± 4	$\pm \boxed{}$

- d) Actual Roots/ Zeros: $\boxed{}$, $\boxed{}$, $\boxed{}$ *Note, arrange the roots in increasing order to avoid being flagged as incorrect.*