

Name \_\_\_\_\_ Student No. \_\_\_\_\_ G\_\_\_\_/\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_  
Nickname: \_\_\_\_\_ Quiz No.: \_\_\_\_\_

## Factoring using Mixed Methods

**A. Factor completely the given polynomial expressions.**

1)  $4x^5 - 4x^3 - 4x^2 + 4$

2)  $64x^6 + 280x^3 + 216$

Factored Form:

$$4(x-1)^2(x+1)(x^2+x+1)$$

Factored Form:

$$8(x+1)(2x+3)(x^2-x+1)(4x^2-6x+9)$$

## Remainder Theorem

**B. Give the remainder of each of the following expressions using remainder theorem.**

1)  $(2x^4 + x^3 - 14x^2 + 5x + 6) \div (2x - 1)$

2)  $(-4x^4 + 2x^3 + 6x^2 - 2x - 2) \div (2 - x)$

Remainder: 0

Remainder: -30

## Factor Theorem

**C. State if the given binomial is a factor of the given polynomial.**

1)  $(-4x^4 + 6x^3 + 24x^2 - 14x - 12) \div (2x - 3)$

2)  $(-x^2 - 2x + 3) \div (2x + 2)$

Answer: Not a Factor

Answer: Not a Factor

## Rational Root Theorem

**D. Identify the nature of the roots (table of variations), the number of roots (FTA), possible roots, actual roots and the factored form of the given polynomial.**

1)  $f(x) = -x^3 + 3x^2 - 3x + 1$

2)  $f(x) = -x^4 + 10x^2 - 9$

FTA: Atmost 3  
Factored form:  $-(x-1)^3$   
Actual roots: 1 mul. 3

FTA: Atmost 4  
Factored form:  $-(x-3)(x-1)(x+1)(x+3)$   
Actual roots: -3, -1, 1, 3

## Graphing Polynomial

**E. Give the possible roots (RRT), nature of roots (DRS), number of roots (FTA), factored form, actual roots, end behavior and graph of the given polynomial.**

1)  $f(x) = x^3 + x^2 - 5x + 3$

2)  $f(x) = x^4 + x^3 - 7x^2 - x + 6$

FTA: Atmost 3

Factored form:  $(x - 1)^2 (x + 3)$

Actual roots: -3, 1 mul. 2

End Behavior:

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$$

$$f(x) \rightarrow \infty \text{ as } x \rightarrow \infty$$

Graph:

FTA: Atmost 4

Factored form:  $(x - 2)(x - 1)(x + 1)(x + 3)$

Actual roots: -3, -1, 1, 2

End Behavior:

$$f(x) \rightarrow \infty \text{ as } x \rightarrow -\infty$$

$$f(x) \rightarrow \infty \text{ as } x \rightarrow \infty$$

Graph: