

## COLLEGE ALGEBRA QUIZ

- (1) Use the factor theorem to factor  $f(x) = x^4 + x^3 - 3x^2 - 5x - 2$ .  
**Solution:**  $(x + 1)^3(x - 2)$
- (2) Using long division, divide  $f(x)$  by  $d(x)$ .  
Given:  $f(x) = 7x^3 - 12x^2 + 4x - 1$ ,  $d(x) = x - 3$   
Then express  $f(x)$  as,  $f(x) = d(x) \cdot q(x) + r(x)$ .  
Where  $d(x)$  is the divisor,  $q(x)$  is the quotient, and  $r(x)$  is the remainder.  
**Solution:**  $f(x) = (x - 3)(7x^2 + 16x + 52) + 155$
- (3) Using long division, divide  $f(x)$  by  $d(x)$ .  
Given:  $f(x) = x^4 - 5x^3 + x + 2$ ,  $d(x) = x + 1$   
Then express  $f(x)$  as,  $f(x) = d(x) \cdot q(x) + r(x)$ .  
Where  $d(x)$  is the divisor,  $q(x)$  is the quotient, and  $r(x)$  is the remainder.  
**Solution:**  $f(x) = (x + 1)(x^3 - 6x^2 + 6x - 5) + 7$
- (4) Using synthetic division, divide  $x^3 + 4x^2 - 3x - 110$  by  $x - 5$ .  
(a) What is the quotient?  
**Solution:**  $x^2 + 9x + 42$   
(b) What is the remainder?  
**Solution:** 100
- (5) Using synthetic division, divide  $x^4 + 4x^3 + 4x^2 + 4x + 3$  by  $x + 3$ .  
(a) What is the quotient?  
**Solution:**  $x^3 + x^2 + x + 1$   
(b) What is the remainder?  
**Solution:** 0
- (6) Using synthetic division, divide  $x^5 - 2x + 1$  by  $x + 1$ .  
(a) What is the quotient?  
**Solution:**  $x^4 - x^3 + x^2 - x - 1$   
(b) What is the remainder?  
**Solution:** 2
- (7) Find  $f(-2)$ , given  $f(x) = x^3 + 2x^2 - 10x + 15$ . Use synthetic division.  
**Solution:** 35

(8) Find  $f(-3)$ , given  $f(x) = x^4 - 81$ . Use synthetic division.

**Solution: 0**

(9) Find  $f(-10)$ , given  $f(x) = x^5 - x^4 + 4x^3 - x^2 + x - 200$ . Use synthetic division.

**Solution: -114,310**

(10) Using synthetic division, determine whether  $-i$ , and  $-6$  are zeros of  $f(x)$ . Given,  
 $f(x) = x^3 - 6x^2 + x - 6$ .

**Solution: Yes and No.**

(11) Using synthetic division, determine whether 1, and  $-1$  are zeros of  $f(x)$ . Given,  
 $f(x) = x^4 - 4x^3 - 3x^2 + 14x + 12$ .

**Solution: No and Yes.**