

高一高数第一学期考试复习

1. By using synthetic divisions method evaluate $(x^4 - 2x^3 + 5x - 7) \div (x - 2)$
利用综合除法计算 $(x^4 - 2x^3 + 5x - 7) \div (x - 2)$

$$\text{Quotient} = x^3 + 5, \text{Remainder} = 3$$

2. By using synthetic divisions method evaluate $(2x^3 - 7x^2 + 12x - 9) \div (2x - 3)$
利用综合除法计算 $(2x^3 - 7x^2 + 12x - 9) \div (2x - 3)$

$$\text{Quotient} = x^2 - 2x + 3, \text{Remainder} = 0$$

3. Factorize $f(x) = x^4 - 4x^3 - x^2 + 16x - 12$
因式分解 $f(x) = x^4 - 4x^3 - x^2 + 16x - 12$

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

4. Solve the equation $x^3 + 3x^2 - 4x - 12 = 0$
解方程式 $x^3 + 3x^2 - 4x - 12 = 0$

$$x = 2, -3, -2$$

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5. Find the remainder when $4x^3 - 5x + 1$ is divided by
- $x - 2$
 - $x + 3$
 - $2x - 1$

若除以以下式子，求方程式 $4x^3 - 5x + 1$ 的余式

- $x - 2$
- $x + 3$
- $2x - 1$

a. 23, b. -92. c. -1

6. The expression $4x^2 - px + 7$ leaves a remainder of -2 when divided by $x - 3$. Find the value of p

方程式 $4x^2 - px + 7$ 除以 $x - 3$ 时得余数 -2 ，求 p

p = 15

7. Determine whether or not $x + 1$ is a factor of the following polynomials

判断 $x + 1$ 是否是下列多项式的因子

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

a. yes, b. no

8. The expression $ax^3 - 8x^2 + bx + 6$ is exactly divisible by $x^2 - 2x - 3$. Calculate the value of a and b

若方程式 $ax^3 - 8x^2 + bx + 6$ 可以被 $x^2 - 2x - 3$ 整除，求 a 和 b

a = 3, b = -5

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9. $f(x)$ leaves a remainder of 5 and 7 when divided by $(x - 1)$ and $(x - 2)$ respectively. Calculate the remainder when $f(x)$ is divided by $(x - 1)(x - 2)$

已知 $f(x)$ 除以 $(x - 1)$ 和 $(x - 2)$ 得余数5和7, 求 $f(x)$ 除以 $(x - 1)(x - 2)$ 的余式

$$2x + 3$$

10. When $f(x)$ is divided by $x - 1$, the remainder is -1 ; when it is divided by x^2 , the remainder is $-x - 1$. Find the remainder when $f(x)$ is divided by $x^2(x - 1)$

当 $f(x)$ 除以 $x - 1$ 得余数 -1 ; 除以 x^2 时的余式 $-x - 1$ 求 $f(x)$ 除以 $x^2(x - 1)$ 的余式

$$x^2 - x - 1$$

11. Given $f(x)$ is a polynomial for degree 3. When $f(x)$ is divided by $(x - 1)$ and $(x + 1)$, the remainder are 9 and -5 respectively. And when it is divided by $(x^2 + 1)$, the remainder is $(3x - 4)$. Find the polynomial $f(x)$

已知 $f(x)$ 是一个三次多项式, 当 $f(x)$ 除以 $(x - 1)$ 和 $(x + 1)$ 时, 得余数9和 -5 , 当除以 $(x^2 + 1)$ 时, 得余式 $(3x - 4)$, 求多项式 $f(x)$

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

12. $f(x) = ax^2 + bx + c$, $f(x + 3) - f(x - 1) = 3x$, when $f(x)$ is divided by $(x - 4)$, the remainder is 6. Find the value of c

$f(x) = ax^2 + bx + c$, $f(x + 3) - f(x - 1) = 3x$, 当 $f(x)$ 除以 $(x - 4)$, 得余数6, 求 c

$$c = 3$$

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13. $f(x) = x^2 - 5$, $g(x + 2) = f(x - 1)$, $h(x - 3) = g(x - 2)$, find the remainder when $f(x + 1) - xh(x + 2)$ is divided by $(x - 2)$

$f(x) = x^2 - 5$, $g(x + 2) = f(x - 1)$, $h(x - 3) = g(x - 2)$, 求 $f(x + 1) - xh(x + 2)$ 除以 $(x - 2)$ 的余式

$R = 6$

14. Solve $x^4 - 10x^3 + 26x^2 - 10x + 1 = 0$
解 $x^4 - 10x^3 + 26x^2 - 10x + 1 = 0$



15. Factorise $x(x - 1)(x - 2)(x - 3) - 24$
因式分解 $x(x - 1)(x - 2)(x - 3) - 24$

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

16. Factorise $27x^3 + 8$
因式分解 $27x^3 + 8$

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

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17. Factorise $x^4 - 14x^2 + 1$

因式分解 $x^4 - 14x^2 + 1$

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

18. Solve $x^4 - 3x^2 + 1 = 0$

解 $x^4 - 3x^2 + 1 = 0$

19. Find a quadratic function $f(x)$ if $f(1) = 0, f(-2) = 0, f(3) = 40$

求一元二次方程 $f(x)$ 若 $f(1) = 0, f(-2) = 0, f(3) = 40$

$$\frac{-1 \pm \sqrt{5}}{2}, \frac{1 \pm \sqrt{5}}{2}$$

$$4x^2 + 4x - 8$$