

Key

2nd Semester Review – Pre-Calculus

Chapter 2

Divide.

1. $(3x^4 - 7x^2 + 2x - 10) \div (x - 3)$

3 | 3 0 -7 2 -10
 9 27 62 176

3x^3 + 9x^2 + 20x + 62 + 176/(x-3)

2. $(3x^5 + 13x^4 + 12x - 1) \div (x + 5)$

-5 | 3 13 0 0 12 -1
 -15 -50 50 -250 1250 -6250

3x^4 - 2x^3 + 10x^2 - 50x + 262 + -1311/(x+5)

Find all the zeros (real and complex).

3. $f(x) = x^5 - 5x^3 + 4x$

x(x^4 - 5x^2 + 4)
x(x^2 - 4)(x^2 - 1)
x(x-2)(x+2)(x-1)(x+1)
x = 0, ±2, ±1

4. $f(x) = 3x^3 - 20x^2 + 27x - 10$

1 | 3 -20 27 -10
3 | 3 -17 10 0
5 | 3 -2 0
3x - 2 = 0 | x = 2/3, 1, 5

5. $f(x) = x^4 + x^3 - 8x^2 - 9x - 9$

-3 | 1 1 -8 -9 -9
3 | 1 -2 -3 0
x^2 + x + 1 = 0
x = (-1 ± √(1-4))/2 = (-1 ± √3)i/2

x = -3, 3, (-1 ± √3)i/2

6. Find a polynomial equation with zeros of 0, 3, and -2.

f(x) = x(x-3)(x+2) = x^3 - x^2 - 6x

7. Find a polynomial equation with zeros of 2, 3 + i, and 3 - 2i.

f(x) = (x-2)(x-3-i)(x-3+i) = (x-2)(x^2 - 6x + 10)

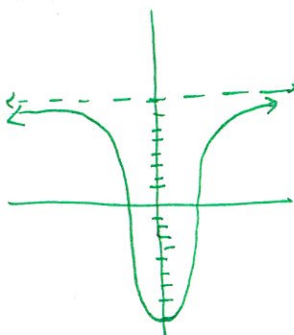
8. Write $f(x) = x^3 + 4x^2 + 9x + 36$ as a product of linear factors.

x^2(x+4) + 9(x+4) = (x+3i)(x-3i)(x+4)

Find all the asymptotes, then graph each rational function.

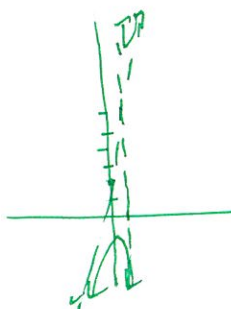
9. $f(x) = \frac{8x^2 - 9}{x^2 + 1}$

H: y = 8
V: none
S: none



10. $f(x) = \frac{4x^2 - 2x + 7}{x - 1}$

H: none
V: x = 1
S: y = 4x + 2



11. $f(x) = \frac{x}{x^2 - 9}$

H: y = 0
V: x = ±3
S: none

