

43  $f(x) = x^3 + 2x^2 - 5x - 6 = 0$

$P: \pm 1, \pm 2, \pm 3, \pm 6$

$Q: \pm 1$

$\frac{P}{Q}: \pm 1, \pm 2, \pm 3, \pm 6$

Descartes  
 $f(x) = x^3 + 2x^2 - 5x - 6$   
 (Signs: +, +, -, -)  
 (Signs: -, +, +, -)

+	-	i
1	2	0
1	0	2

$f(-x) = -x^3 + 2x^2 - 5x - 6$   
 (Signs: -, +, +, -)  
 (Signs: -, +, +, -)

r	1	2	-5	-6
-1	1	1	-6	0

$(x+1)(x^2+x-6)$   
 $(x+1)(x-2)(x+3) = 0$   
 $x = -1, 2, -3$

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

$P: \pm 1, \pm 2, \pm 4$

$Q: \pm 1$

$\frac{P}{Q}: \pm 1, \pm 2, \pm 4$

$x^3 - 4x^2 + 6x - 4$   
 (Signs: +, -, +, -)  
 (Signs: -, +, -, +)

$f(-x) = -x^3 + 4x^2 - 6x + 4$   
 No sign changes

+	-	i
3	0	0
1	0	2

$2 \mid 1 \quad -4 \quad 6 \quad -4$   
 $\quad 1 \quad -2 \quad 2 \quad 0$   
 $(x-2)(x^2-2x+2)$

$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(2)}}{2(1)}$   
 $= \frac{2 \pm \sqrt{-4}}{2}$   
 $= \frac{2 \pm 2i}{2}$   
 $x = 1 \pm i, 2$