2.6

$$f(x) = x^2 + 36$$

Zeros

$y = 0$

x-intercepts

roots

$$x^2 + 36 = 0$$

$$\sqrt{x^2} = \sqrt{-36}$$

$$x = \pm 6i$$

$h(x) = x^3 - 3x^2 + 4x - 2$

$+ \quad - \quad + \quad -$

Possible Rational Real Zeros

$p \pm 1, \pm 2$

$q \pm 1$

$\frac{p}{q} = \pm 1, \pm 2$

3 or 1 positive real roots

$h(-x) = (-x)^3 - 3(-x)^2 + 4(-x) - 2$

$= -x^3 - 3x^2 - 4x - 2$

0 negative real roots

1	1	-3	4	-2
		1	-2	2
	1	-2	2	0
	x^2	$-2x$	2_c	0_R

$x^2 - 2x + 2 = 0$ $\quad a=1, \ b=-2, \ c=2$

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

$x = \frac{+2 \pm \sqrt{4 - 8}}{2}$

$x = \frac{2 \pm \sqrt{-4}}{2}$

$x = \frac{2 \pm 2i}{2}$

$x = 1 \pm i$

$x = 1$ $\quad x = 1 + i$ $\quad x = 1 - i$

$-1 \ -1$ $\quad -1+i \ -1 \ -i$ $\quad -1+i \ -1 \ +i$

$(x-1)$ $\quad (x-1-i)$ $\quad (x-1+i)$

$f(x) = +x^4 - 7x^2 - 8$

Possible Rational Real

p $\pm 1, \pm 2, \pm 4, \pm 8$

q ± 1

$\frac{p}{q}$ $\pm 1, \pm 2, \pm 4, \pm 8$

1 pos real

$f(-x) = (-x)^4 - 7(-x)^2 - 8$

$x^4 - 7x^2 - 8$

1 neg real root

Sum of Roots $-\frac{B}{A}$

$Ax^2 + Bx + C$

$Ax^3 + Bx^2 + Cx + D$

$x^4 - 7x^2 - 8 = 0$

Factored Irreducible over Rationals $(x^2 - 8)(x^2 + 1) = 0$

$x^2 - 8 = 0$ $+8 \; +8$ $x^2 + 1 = 0$

$\sqrt{x^2} = \sqrt{8}$

$x = \pm 2\sqrt{2}$

Factored $x = 2\sqrt{2}$ $x = -2\sqrt{2}$

$(x - 2\sqrt{2})(x + 2\sqrt{2})(x^2 + 1)$

Irreducible over Reals

$x^2 + 1 = 0$

$\sqrt{x^2} = \sqrt{-1}$

$x = \pm i$

$x = i$ $x = -i$

Completely factored $(x - 2\sqrt{2})(x + 2\sqrt{2})(x - i)(x + i)$

$x = \pm 2\sqrt{2}$ $x = \pm i$

Zeros

$f(x) = 2x^3 + 3x^2 + 8x + 12 \quad ; 2i$

$2i$	2	3	8	12
		$4i$	$6i-8$	-12
	2	$3+4i$	$6i$	0
$-2i$		$-4i$	$-6i$	
	2	3	0	
	x	c	R	

$2x + 3$

$2x + 3 = 0$

$\frac{2x}{2} = \frac{-3}{2}$

$x = -\frac{3}{2}$

$x = \pm 2i, -\frac{3}{2}$