W-A2 Algebra 2 Week 29

Chapter 6: Polynomials

Name (term number and highest degree)

$f(x) = x^3 + 4x - 3$ (3) ←

3 terms

trinomial

3rd degree

"cubic"

"cubic trinomial"

x^3 →	cubic
x^2 →	quadratic
x →	linear
6 →	constant
$x^{4 \text{ or higher}}$ →	nth term
x^5 →	5th degree

# of terms

1 →	monomial
2 →	binomial
3 →	trinomial
4 or more →	polynomial

$f(x) = 4x + x + 2$ simplify

$5x + 2$ linear binomial

$x^7 - 3x^5 - 2$ 7th degree polynomial

Find the "roots" or zeros of a function

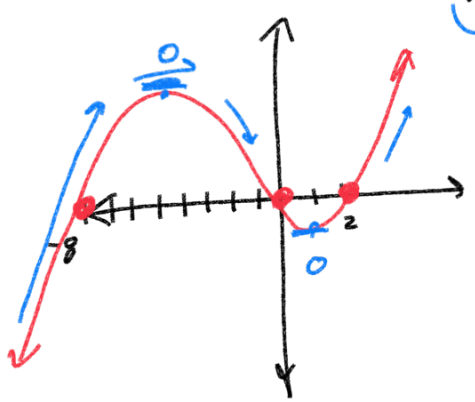
$f(x) = x(x+8)(x-2) = 0$

$x = 0$

$x + 8 = 0$
$-8 \quad -8$
$x = -8$

$x - 2 = 0$
$+2 \quad +2$
$x = 2$

$(x+8)(x-2)$
$x^2 - 2x + 8x - 16$
$x(x^2 + 6x - 16)$
$x^3 + 6x^2 - 16x$



$x^3 + 6x^2 - 16x$

$3x^2 + 12x - 16$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-12 \pm \sqrt{12^2 - 4(3)(-16)}}{2(3)} = \frac{-12 \pm \sqrt{144 + 192}}{6}$$

$$\frac{-12 \pm \sqrt{336}}{6} \qquad \frac{-12 \pm 4\sqrt{21}}{6}$$

$$\frac{-6 \pm 2\sqrt{21}}{3} = 1.055$$

$f(x) = (x^2-4)(x^2-9) = 0$

$x^2-4=0$ $\quad$ $x^2-9=0$

$+4\ +4$ $\quad$ $+9\ +9$

$\sqrt{x^2}=\sqrt{4}$ $\quad$ $\sqrt{x^2}=\sqrt{9}$

$x = \pm 2$ $\quad$ $x = \pm 3$

$x=2$ $\quad$ $x=-2$ $\quad$ $x=3$ $\quad$ $x=-3$

$(x^2-4)(x^2-9)$

$x^4-9x^2-4x^2+36$

x^4-13x^2+36 ← 4th degree

maximum number of real solutions

$f(x) = 3x(x+4)(x+5)^{(2)}$ — multiplicity of 2

$(x+5)(x+5)$

$3x(x+4)(x+5)(x+5)$

$3x(x+4)(x^2+10x+25)$

$3x(x^3+10x^2+25x$
$\quad 4x^2+40x+100$

$3x(x^3+14x^2+65x+100)$

$3x^{(4)}+42x^3+195x^2+300x$

$3x$ $\quad$ $x+4=0$ $\quad$ $x+5=0$

$\frac{3x}{3}=\frac{0}{3}$ $\quad$ $-4\ -4$ $\quad$ $-5\ -5$

$x=0$ $\quad$ $x=-4$ $\quad$ $x=-5$

$x = 0, -4, -5$ mult of 2

$f(x) = (x^2+16)(x-3)(x-5)^3 = 0$

6 sols

2 sols | 1 sol | 3 sol

2 intercepts

$x^2+16=0$

$x-3=0$
$+3\ +3$
$x=3$

$x-5=0$
$+5\ +5$
$x=5$ mult of 3

$x^2+16=0$
$-16\ -16$
$\sqrt{x^2} = \sqrt{-16}$

$x = \pm 4i$

$x = 4i$
$x = -4i$ imaginary

Write a polynomial with zeros:

5, -1, 3

Go Backwards!

$x=5$ | $x=-1$ | $x=3$

$-5\ -5$ | $+1\ +1$ | $-3\ -3$

$x-5=0$ | $x+1=0$ | $x-3=0$

FOIL

$[(x-5)(x+1)](x-3)=0$

$x^2+x-5x-5$

$(x^2-4x-5)(x-3)=0$

4, 3 (mult of 2)

$x=4$ | $x=3$ | $x=3$

x^3-4x^2-5x

$+\quad -3x^2+12x+15$

$x^3-7x^2+7x+15$

HW

Ch 6.1 evens
6.2 evens
Supplemental WS
Online HW 29 } May 12th
Q 29

HW/Q 27 April 30th