TH-A2 Algebra 2 Week 29

Name Polynomials

0th → constant
1st → linear
2nd → quadratic
3rd → cubic
4th or higher → 4th ...

Number of terms

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

$4x^3 + 7x^2 - 12x + 28$

cubic polynomial

$8x^9 - 7$

9th degree binomial

Find the roots

$(3x-1)(x^2-5)=0$

$3x-1=0$ $\quad x^2-5=0$

$+1\ +1$ $\quad +5\ +5$

$\frac{3x}{3}=\frac{1}{3}$ $\quad \sqrt{x^2}=\sqrt{5}$

$x=\frac{1}{3}$ $\quad x=\pm\sqrt{5}$

$x=\frac{1}{3},\ \sqrt{5},\ -\sqrt{5}$

Find the roots

$(x)(2x-3)^{2}(x^2+4)=0$

$x=0$

$2x-3=0$ mult of 2

$+3 \quad +3$

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

$x=\frac{3}{2}$ (mult of 2)

$x^2+4=0$

$-4 \quad -4$

$\sqrt{x^2}=\sqrt{-4}$

$x=\pm 2i$

$x=2i, -2i$

5 solutions

2 x-int.

0, -1, 4

$x=0$

$x=-1$

$+1 \quad +1$

$x+1=0$

$x=4$

$-4 \quad -4$

$x-4=0$

FOIL

$(x)(x+1)(x-4)=0$

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

$(x)(x^2-3x-4)$

x^3-3x^2-4x

up to 3 solutions

1, -2, 6

$X = 1$ $\quad X = -2$ $\quad X = 6$

$-1 \ -1 \quad +2 \ +2 \quad -6 \ -6$

$X - 1 = 0 \quad X + 2 = 0 \quad X - 6 = 0$

$(X-1)(X+2)(X-6) = 0$

$X^2 + 2X - X - 2$

$(X^2 + X - 2)(X - 6)$

$X^3 + X^2 - 2X$

$+ \quad -6X^2 - 6X + 12$

$X^3 - 5X^2 - 8X + 12$

3 (mult of 2, 1) -5

$X = 3 \quad X = 3 \quad X = -5$

$(X-3)(X-3)(X+5)$

Polynomial Long Division

$2x^2+6x-7$ by $x+1$

$$\frac{2x^2+6x-7}{x+1}$$

$$\frac{2x^2}{x+1}+\frac{6x}{x+1}-\frac{7}{x+1}$$

$$2x + 4 - \frac{11}{x+1}$$

$$x+1 \;\overline{)\; 2x^2+6x-7}$$

$-2x^2 \mp 2x$

$4x-7$

$-4x \mp 4$

-11

$\frac{2x^2}{x} = 2x \qquad \frac{4x}{x} = 4$

$$\boxed{2x+4-\frac{11}{x+1}}$$

$x+1=0$

$-1 \quad -1$

$x=-1$

$$\frac{4+8}{1+2} = \frac{12}{3} = 4$$

$$\frac{4}{1+2}+\frac{8}{1+2}$$

$$\frac{4}{3}+\frac{8}{3}=\frac{12}{5}$$

Synthetic Division

-1 | $2 \quad 6 \quad -7$

$\downarrow \quad -2 \quad -4$

$2 \quad 4 \quad -11$

$2x+4-\frac{11}{x+1}$

$$\frac{x^2-4}{x+2} = x-2$$

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

$$\frac{x^2-4}{x+2} = \frac{(x+2)(x-2)}{x+2}$$

$x+2$ | $x-2$

x^2+0x-4

$-x^2 \mp 2x$ ↓

$-2x-4$

$+2x+4$

0

$x+2=0$

$-2\ -2$

$x=2$

-2 | $1 \quad 0 \quad -4$

↓ $-2 \quad 4$

$1 \quad -2 \quad 0$

↓ ↓

$x \quad -2$

x^3+5x^2-3x-4 | $x+6$

$x^2-x+3-\frac{22}{x+6}$

$x+6$ | x^3+5x^2-3x-4

$-x^2+\bar{6}x^2$ ↓

$-x^2-3x$ ↓

$+x^2+6x$

$3x-4$

$-3x\bar{+}18$

-22

$x+6=0$

$-6\ -6$

$x=-6$

-6 | $1 \quad 5 \quad -3 \quad -4$

↓ $-6 \quad 6 \quad -18$

$1 \quad -1 \quad 3 \quad -22$ / $x+6$

$x^2-x+3-\frac{22}{x+6}$

HW

Ch 6-3 evens
Supplemental WS
Online HW 29 } May 13th
Quiz 29

HW/Q 28 May 12th