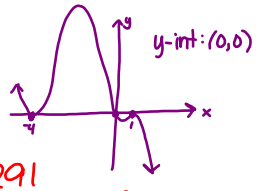
pg 283:

16.

z	m	T/C
-4	2	T
0	1	C
1	2	T



pg 291

14. $Q(x) = x^2 + 2x + 1$

$R(x) = 12$

$x^2 + 2x + 1 + \frac{12}{x-2}$

pg 302

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

52. $\frac{p}{q} = \pm 1, \pm 3, \pm 9, \pm\frac{1}{3}$

55. $\{-3, \pm\sqrt{2}\}$

$f(x) = (x+3)(x+\sqrt{2})(x-\sqrt{2})$

56. $\{1, \pm\sqrt{3}\}$

$f(x) = (x-1)(x+\sqrt{3})(x-\sqrt{3})$

58. $\{-2, 1 \pm i\}$

$f(x) = (x+2)(x-(1+i))(x-(1-i))$

OR

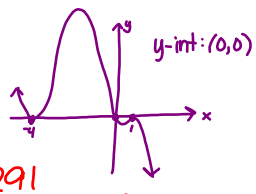
$f(x) = (x+2)(x-1-i)(x-1+i)$

Oct 19-8:33 PM

pg 283:

16.

z	m	T/C
-4	2	T
0	1	C
1	2	T



pg 291

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OR

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14) $(x^3 - 3x + 10) \div (x-2)$

$2 \mid 1 \;\; 0 \;\; -3 \;\; 10$

$\downarrow \;\; 2 \;\; 4 \;\; 2$

$1 \;\; 2 \;\; 1 \;\; | \;\; 12 = R$

$x^2 + 2x + 1$

Oct 19-8:33 PM

58. $\frac{p}{q} = \pm 1, \pm 2, \pm 4$

Calc → -2 | 1 0 -2 4
-2 4 -4
1 -2 2 | 0 = R ✓

$x^2 - 2x + 2 = 0$

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

$x = 1 \pm i \quad -2$

$f(x) = (x+2)(x-(1 \pm i))$

$f(x) = (x+2)(x-1-i)(x-1+i)$

Nov 1-7:44 AM

Quiz Tomorrow
No Calculator

Writing Equations of Polynomial Functions

Oct 19-8:26 PM

Write a polynomial function with the given numbers as zeros

- Write out
- Multiply out

1. -2, 4

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

$P(x)=x^2-2x-8$

If Poly EQ:

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

2. -1, 2, 5

$P(x)=(x+1)(x-2)(x-5)$

$=(x^2-x-2)(x-5)$

$=x^3-x^2-2x-5x^2+5x+10$

$P(x)=x^3-6x^2+3x+10$

Oct 19-8:34 PM

Complex roots occur in conjugate pairs.

ie If a complex number a + bi, b ≠ 0, is a zero of a function f(x) with real coefficients then its conjugate, a – bi, is also a zero.

Irrational zeros also occur in conjugate pairs. $(x-1-\sqrt{2})(x-1+\sqrt{2})$

Using Sum/Product Method to write quadratic equations or factors

ax^2+bx+c

$x^2 + bx + c = 0$

$x^2-\text{sum}\,x+\text{prod}$

a = 1

b = -sum of roots $-(r_1 + r_2)$

c = product of roots $r_1 \cdot r_2$

Oct 19-8:37 PM

Find a polynomial function of lowest degree with rational coefficients that has the given numbers as some of its zeros.

1. ① $1+i, 1-i$

x^2+bx+c

$x^2-\text{sum}x+\text{prod}$ $a=1$

$b=-\text{sum}: -(1+i+1-i) = -(2) = -2 = b$

$c=\text{prod}: (1+i)(1-i) = 1-i+i-i^2 = 1-(-1) = 2 = c$

x^2-2x+2

$P(x)=(x-1)(x^2-2x+2)$

$P(x)=x^3-2x^2+2x-x^2+2x-2$

$\boxed{P(x)=x^3-3x^2+4x-2}$

Oct 19-8:41 PM

2. $0, 2, 2-\sqrt{5}, 2+\sqrt{5}$ $x \to x-2$

$a=1$

$b=-\text{sum}=-(2-\sqrt{5}+2+\sqrt{5}) = -4 = b$

$c=\text{prod}=(2-\sqrt{5})(2+\sqrt{5}) = 4-5 = -1 = c$

x^2-4x-1

$P(x)=x(x-2)(x^2-4x-1)$

$P(x)=(x^2-2x)(x^2-4x-1)$

$P(x)=x^4-4x^3-x^2-2x^3+8x^2+2x$

$P(x)=x^4-6x^3+7x^2+2x$

Oct 19-8:41 PM

Couple of review questions on next slide or add to homework.

3. $-\sqrt{2},\ 3i,\ \sqrt{2},\ -3i$

$b = -sum = -(-\sqrt{2}+\sqrt{2}) = 0 = b$

$c = prod = -\sqrt{2}\cdot\sqrt{2} = -2 = c$ $\quad x^2-2$

$b = -sum = -(3i-3i) = 0 = b$

$c = prod = (3i)(-3i) = -9i^2 = 9 = c$ $\quad x^2+9$

$P(x) = (x^2-2)(x^2+9)$

$= x^4+9x^2-2x^2-18$

$P(x) = x^4+7x^2-18$

Oct 27-10:34 AM

1. Find all of the possible rational roots for th equation

$3x^3+2x^2+4x+5=0$

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

3. $f(x) = -x(x-1)^2(x+2)^3$

(a) degree
(b) rational zeros (max. possible)
(c) x-intercepts (max. possible)
(d) turning points (max possible)
(e) end behavior

Oct 17-8:51 AM

1. Find all of the possible rational roots for the equation $3x^3+2x^2+4x+5=0$

$p=5: \pm1, \pm5$ $q=3: \pm1, \pm3$ $\frac{p}{q} = \pm1, \pm5, \pm\frac{5}{3}, \pm\frac{1}{3}$

2. $f(x) = -9x^3 + 5x^2 + 3x^5 + 4x^4$ $+x^{odd}$ $-x^{even}$

3. $f(x) = -x(x-1)^2(x+2)^3$

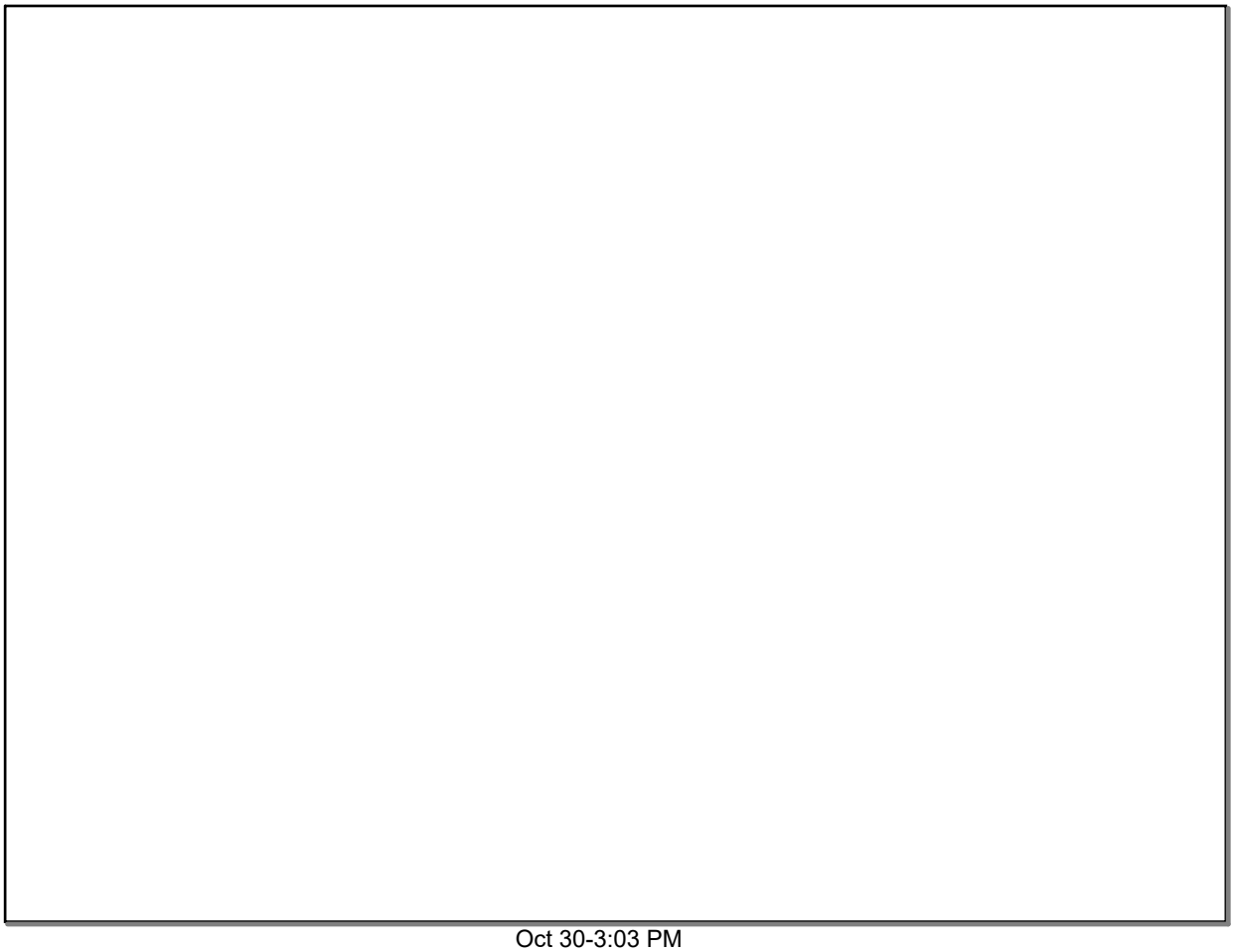
	#2	#3
(a) degree	5	6
(b) rational zeros (max. possible)	5	6
(c) x-intercepts (max. possible)	5	6
(d) turning points (max possible)	4	5
(e) end behavior	↗↘	↖↘

Oct 17-8:51 AM

Homework:
pg 270: 15, 31
pg 291: 20
pg 302: 40

QUIZ TOMORROW - NO Calculator!
Synthetic division
End behavior
Sketch Graph - with all components used in notes

Oct 19-8:42 PM



Oct 30-3:03 PM