APPENDIX D
GALOIS THEORY PROJECT

You are assigned two polynomials.

For $f(x)$ you must find
- the zeros of the Galois Group $G = G(\mathbb{Q}[f(x) = 0]/\mathbb{Q})$,
- the subgroups of G,
- the fixed fields of the elements of G,
- the subfields of $\mathbb{Q}[f(x) = 0]$.

You must illustrate the Galois Correspondence in a table. [Optionally, if there aren't too many subgroups and subfields, you might like to draw a diagram to illustrate their connections.]

For $g(x)$ you are to show that it is prime over $\mathbb{Q}$ and that it is not soluble by radicals over $\mathbb{Q}$.

#	**f(x)**
1	$x^8 + 14x^6 – 700x^2 – 2500$
2	$x^8 – 28x^6 + 12\ x^5 – 336\ x^3 + 8x^2 – 224$
3	$x^8 + 10x^4 + 169$
4	$x^8 + 7x^7 – 11x^5 – 86x^4 – 63x^3 + 99x + 693$
5	$x^8 + 3x^6 – 18x^5 – 54x^3 + 65x^2 + 195$
6	$x^8 + 38x^7 + 364x^6 – 5x^2 – 190x – 1820$
7	$x^8 + 20x^6 – 2020x^2 – 10201$
8	$x^8 – 80x^6 + 18\ x^5 – 1440\ x^3 + x^2 – 80$
9	$x^8 + 24x^4 + 169$
10	$x^8 + 7x^7 – 9x^5 – 72x^4 – 63x^3 + 81x + 567$
11	$x^8 + 3x^6 – 22x^5 – 66x^3 + 85x^2 + 255$
12	$x^8 + 34x^7 + 292x^6 – 5x^2 – 170x – 1460$
13	$x^8 + 12x^6 – 444x^2 – 1369$
14	$x^8 – 41x^6 + 14\ x^5 – 574\ x^3 + 8x^2 – 328$
15	$x^8 + 12x^4 + 100$
16	$x^8 + 5x^7 – 11x^5 – 64x^4 – 45x^3 + 99x + 495$
17	$x^8 + 3x^6 – 24x^5 – 72x^3 + 95x^2 + 285$
18	$x^8 + 26x^7 + 172x^6 – 7x^2 – 182x – 1204$
19	$x^8 + 8x^6 – 136x^2 – 289$
20	$x^8 – 48x^6 + 14\ x^5 – 672\ x^3 + x^2 – 48$
21	$x^8 + 16x^4 + 100$
22	$x^8 + 9x^7 – 11x^5 – 108x^4 – 81x^3 + 99x + 891$
23	$x^8 + 3x^6 – 26x^5 – 78x^3 + 133x^2 + 399$
24	$x^8 + 38x^7 + 364x^6 – 11x^2 – 418x – 4004$
25	$x^8 + 10x^6 – 260x^2 – 676$

26	$x^8 - 56x^6 + 16\,x^5 - 896\,x^3 + 8x^2 - 448$
27	$x^8 + 3x^6 - 20x^5 - 60x^3 + 91x^2 + 273$
28	$x^8 + 26x^7 + 172x^6 - 5x^2 - 130x - 860$
29	$x^8 + 16x^6 - 1040x^2 - 4225$
30	$x^8 - 17x^6 + 10\,x^5 - 170\,x^3 + 8x^2 - 136$

#	**g(x)**
1	$x^5 + 6x^4 + 6x^3 + 6x^2 + 8x - 8$
2	$x^5 - 6x^4 + 6x^3 + 6x^2 + 2x + 8$
3	$x^5 + 6x^4 + 4x^2 + 10x - 4$
4	$x^5 + 6x^4 + 2x^2 + 10x + 4$
5	$x^5 - 6x^4 + 4x^3 + 10x - 8$
6	$x^5 + 6x^4 + 4x^3 + 10x + 8$
7	$x^5 - 6x^4 + 4x^3 - 2x^2 + 12x - 4$
8	$x^5 + 6x^4 - 8x^3 + 4x - 4$
9	$x^5 - 6x^4 + 4x^3 + 8x^2 - 8$
10	$x^5 + 6x^4 - 2x^3 + 2x^2 + 14x + 4$
11	$x^5 - 6x^4 + 2x^3 + 10x^2 + 4$
12	$x^5 + 6x^4 + 2x^3 + 10x^2 + 4x - 4$
13	$x^5 - 6x^4 + 2x^3 + 4x^2 + 8x - 4$
14	$x^5 - 6x^4 - 10x^3 - 4x^2 - 6x - 4$
15	$x^5 - 6x^4 - 10x^3 + 14x^2 + 4x + 4$
16	$x^5 + 6x^4 + 2x^3 + 2x^2 + 8x + 4$
17	$x^5 - 2x^4 - 6x^3 + 12x - 4$
18	$x^5 - 2x^4 - 6x^3 + 6x^2 + 10x - 4$

19	$x^5 - 8x^4 + 6x^2 + 2x + 4$
20	$x^5 - 2x^4 - 6x^3 + 10x^2 + 4$
21	$x^5 - 2x^4 - 6x^3 + 10x^2 + 4x - 8$
22	$x^5 - 8x^4 - 6x^3 + 4x^2 + 14x - 4$
23	$x^5 - 8x^4 + 4x^3 + 6x^2 + 10x - 8$
24	$x^5 + 4x^4 + 4x^3 + 4x^2 - 16x + 4$
25	$x^5 - 2x^4 + 4x^3 + 8x^2 - 8x - 8$
26	$x^5 - 2x^4 - 8x^3 + 2x^2 + 4x - 4$
27	$x^5 - 8x^4 + 2x^3 + 10x^2 + 8$
28	$x^5 - 8x^4 + 2x^3 + 10x^2 - 2x + 4$
29	$x^5 - 2x^4 + 8x^3 + 2x^2 - 12x + 4$
30	$x^5 - 8x^4 + 2x^3 + 14x^2 + 6x - 4$

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LIST OF TITLES

GENERAL
- The Mathematics At The Edge Of The Rational Universe

ELEMENTARY
- Basic Mathematics
- Concepts of Algebra
- Concepts of Calculus

1st YEAR UNI
- Techniques of Algebra
- Techniques of Calculus
- Matrices

2nd YEAR UNI
- Linear Algebra
- Languages & Machines
- Discrete Mathematics

3rd YEAR UNI
- Group Theory vol 1
- Group Theory vol 2
- Galois Theory
- Geometry vol 1
- Geometry vol 2
- Topology
- Set Theory
- Number Theory
- Graph Theory
- Complex Variables

POSTGRADUATE
- Ring Theory
- Representation Theory
- Quadratic Forms
- Group Tables vol 1
- Group Tables vol 2