Unlucky Primes

```
> g := x^2-7*x+15;
```

$$g := x^2 - 7x + 15 \qquad (1)$$

```
> A := expand( g * (x^2+18*x+5) );
```

$$A := x^4 + 11x^3 - 106x^2 + 235x + 75 \qquad (2)$$

```
> B := expand( g * (x^2+x+5) );
```

$$B := x^4 - 6x^3 + 13x^2 - 20x + 75 \qquad (3)$$

```
> gcd(A,B);
```

$$x^2 - 7x + 15 \qquad (4)$$

```
> g1 := Gcd( A, B ) mod 13;
```

$$g1 := x^2 + 6x + 2 \qquad (5)$$

```
> g2 := Gcd( A, B ) mod 17;
```

$$g2 := x^4 + 11x^3 + 13x^2 + 14x + 7 \qquad (6)$$

```
> g3 := Gcd( A, B ) mod 19;
```

$$g3 := x^2 + 12x + 15 \qquad (7)$$

```
> G := chrem( [g1,g2], [13,17] );
```

$$G := 52x^4 + 130x^3 + 183x^2 + 201x + 41 \qquad (8)$$

```
> G := chrem( [g1,g3], [13,19] );
```

$$G := x^2 + 240x + 15 \qquad (9)$$

```
> M := 13*19;
  G := mods( G, M );
```

$$M := 247$$

$$G := x^2 - 7x + 15 \qquad (10)$$

```
> divide(A,G);
  divide(B,G);
```

$$true$$

$$true \qquad (11)$$