> Question 3 coding part

> a)

```
> A := 3*x^2 + 3; B := (x-2)*(x+5);
```

$$A := 3x^2 + 3$$

$$B := (x-2)\,(x+5) \quad (1)$$

```
> resultant(A, B, x);
```

$$1170 \quad (2)$$

> c)

```
> A_bar := 58*x^4-415*x^3-111*x+213;
  B_bar := 69*x^3-112*x^2+413*x+113;
```

$$A\_bar := 58x^4 - 415x^3 - 111x + 213$$

$$B\_bar := 69x^3 - 112x^2 + 413x + 113 \quad (3)$$

```
> r := resultant(A_bar, B_bar, x);
```

$$r := 232546626971939784 \quad (4)$$

```
> primes := ifactors(r);
```

$$primes := [1, [[2, 3], [3, 1], [7, 1], [7039, 1], [196648119467, 1]]] \quad (5)$$

```
> unlucky_primes := [2, 3, 7, 7039, 196648119467];
```

$$unlucky\_primes := [2, 3, 7, 7039, 196648119467] \quad (6)$$

```
> for p in unlucky_primes do
      print(p, Gcd(A_bar mod p, B_bar mod p) mod p);
  od;
```

$$2, x^3 + x + 1$$

$$3, x + 2$$

$$7, x + 5$$

$$7039, x + 5407$$

$$196648119467, x + 51402852970 \quad (7)$$