

# Report for COMP307 Assignment2

## Part2

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## Q1

The terminal set = { x }

## Q2

Function set = { addition, subtraction, multiple, division, negative, cos, sin }

## Q3

Fitness function that GP produce

```
sub(x, sub(add(-1, x), mul(mul(x, x), sub(mul(add(-1, add(-1, x)), x), add(-1, add(-1, 1))))))
```

After expansion the result is  $x^4 - 2x^3 + x^2 + 1$

## Q4

Stopping criteria is when generation achieve 40.

## Q5

Random seeds = 200 :

```
mul(add(x, add(add(sub(x, 1), cos(x)), cos(neg(mul(x, mul(x, 1)))))), add(x, add(sub(mul(x, 1), 1), cos(x))))
```

$(2x + \cos(x) + \cos(-x^2) - 1) \times (2x + \cos(x) - 1)$

Random seeds = 300:

```
mul(mul(add(0, -1), add(add(add(x, -1), mul(1, add(add(cos(x), add(cos(add(cos(x), x)), x)), add(cos(x), x)))), x)), sub(1, x))
```

Random seeds = 350:

```
add(mul(x, neg(sub(mul(x, neg(sub(sub(mul(x, x), x), x))), x))), cos(0))
```