Problem 3

```
div(u,v) {
  if (u == NaN || v == NaN || v == 0) return NaN

  q = 0
  r = u

  while (v.degree <= r.degree) {
    c = r[r.degree] / v[v.degree]
    i = r.degree - v.degree
    term = c * x^i
    q = q + term
    r = r - (v * term)
  }

  return q
}
```

LI: $u = q * v + r$
Base case:
$q = 0$, $r = u \rightarrow q * v + r = 0 * v + u = u$
Induction:
Let $u = q * v + r$ hold through iteration k.

```
c = r[r.degree] / v[v.degree]
i = r.degree - v.degree
term = c * x ^ i
q' = q + term
r' = r - (v * term)

q'*v + r' = q*v + r + v*term - v*term = q*v + r = u
```