1)

Prefix; - x x A B - + C D E / F + G H

Infix;   A x B x C + D - E - F / G + H

Postfix; A B x C D + E - x F G H + / -

2)

insert 42, 27, 31, 19, 89, 62, 100, 83, 22, 75, 52, 12, 72, 90; then delete 52, 22, 42.

Insert 42

            42

Insert 27

            42

27

Insert 31

            42

27

            31

Insert 19

                    42

            27

19   31

Insert 89

                    42

            27   89

19   31

Insert 62

                    42

            27   89

19   31   62

Insert 100

                    42

            27   89

19   31   62   100

Insert 83

```
                42
        27              83
19          31      62          89
                    83              100
```

Insert 22

```
                42
        27              83
19          31      62          89
   22                   83          100
```

Insert 75

```
                42
        27              83
19          31      62          89
   22                   83              100
                75
```

Insert 52

```
                42
        27              83
19          31      62          89
   22           52      83              100
                75
```

Insert 12, 72, 90

```
                42
          27          83
19      31      62          89
12  22      52    83          100
                75          90
          72
```

delete 52, 22, 42

```
                42
          27          83
19      31      62      89
12  22              83          100
                75          90
          72
```

```
                42
          27          83
19      31      62      89
12                  83          100
                75          90
          72
```

```
                62
          27          83
19      31              89
12                  83          100
                75          90
          72
```

3)

4)

addNgram method avg = logn because it behaves like binary search which is divides itself

worst = n because it has to traverse all n nodes one by one

NgramFrequencies method avg = n , it will traverse all nodes and its worst = n, also because of same reason.