Examples of Analysis

Give the asymptotic running time of the following algorithms in Θ notation. Give your solution in the simplest terms possible. Show how you get the answer.

1.
```
function func1(n)
    s ← 0;
    for i ← n to n^2 do
        for j ← n to i do
            s ← s + j − i;
    return(s);
```

2.
```
function func2(n)
    s ← 0;
    for i ← n to n^3 do
        j ← 1;
        while j < i^2 do
            j ← j × 2;
            s ← s + j − i;
    return(s);
```

3.
```
function func3(n)
    s ← 0;
    for i ← n^2 to n^2 + n do
        for j ← i to i + 680 do
            for k ← 1 to j do
                s ← s + j − i + 2k;
    return(s);
```

4.
```
function func4(n)
    s ← 0;
    i ← 1;
    while i < n^2 do
        j ← 1;
        while j < i^2 do
            j ← j + 1;
            s ← s + i − j;
        i ← i × 2;
    return(s);
```

5.
```
function func5(n)
    s ← 0;
    for i ← 1 to 3n^2 do
        for j ← 1 to ⌊2n^3/i⌋ do
            s ← s + i − j;
    return(s);
```