Exercise: Counting operations

Given lists of length N,

Calculate how many multiplications and additions/subtractions are in the following functions. Write your answers in terms of N.

Note: Don't worry about square-root operations.

	Additions+Subtractions	Multiplications
dot(vec1, vec2)		
distance(x1, y1, x2, y2)		
distanceTable		
distanceTableEfficient		

```python
def dot(vec1, vec2):
    N = len(vec1)
    result = 0
    for i in range(N):
        val1 = vec1[i]
        val2 = vec2[i]
        result = result + val1*val2

    return result
```

```python
def distance(x1, y1, x2, y2):
    dx = x1-x2
    dy = y1-y2
    return math.sqrt(dx*dx + dy*dy)
```

```python
def distanceTable(pointList):
    # Distance between all pairs of
    # points

    N = len(pointList)

    for i in range(N):

        for j in range(N):
            p1 = pointList[i]
            p2 = pointList[j]
            d = distance(p1[0], p1[1],
                         p2[0], p2[1])
            print(d, end='\t')
        print()
```

```python
def distanceTableEfficient(pointList):
    # Distance between all pairs of
    # points (without repeats)

    N = len(pointList)

    for i in range(N):
        start = i+1
        for j in range(start, N):
            p1 = pointList[i]
            p2 = pointList[j]
            d = distance(p1[0], p1[1],
                         p2[0], p2[1])
            print(d, end='\t')
        print()
```