a)

Algorithm 1 Cluster Formation with Blackbox Function

```
clusters ← ∅
for each a in P do
    currentCluster ← {a}
    for each b in P do
        if d(a, b) ≤ r then
            currentCluster ← currentCluster ∪ {b}
        end if
    end for
    clusters ← clusters ∪ currentCluster
end for
result ← blackbox(T = clusters, N = k)
return result
```

b)

This would not be possible since the distance to the cluster center is not known prior to running the algorithm in the standard k-center problem. Therefore there is no metric we could use to assign possible cluster points to the cluster centers.

c)

Algorithm 2 Cluster Formation with known OPT

```
clusters ← ∅
while P ≠ ∅ do
    currentCenter ← some c ∈ P
    currentCluster ← ∅
    for each p in P do
        if d(c, p) ≤ 2OPT then
            currentCluster ← currentCluster ∪ {p}
        end if
    end for
    clusters ← clusters ∪ currentCluster
    P ← P \ currentCluster
end while
return clusters
```