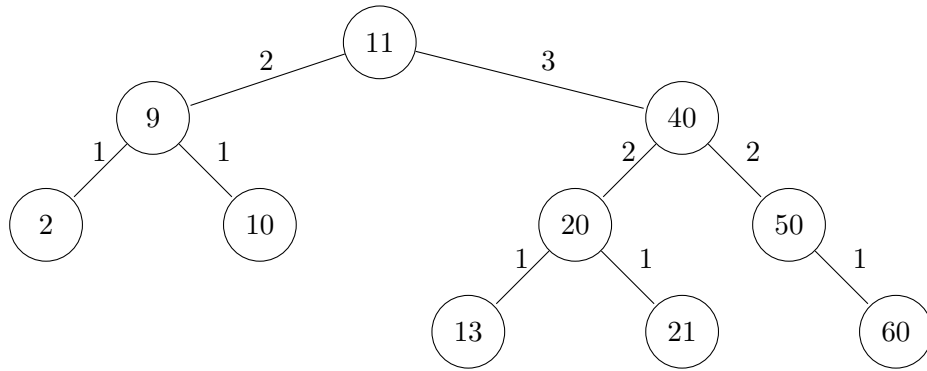**1.**

a)

b) the tree is already balanced as all left and right children differ in height by at most 1.

c)

2.

if the element E is smaller that $2^{\ell-2} - 1$ elements than it is bigger than at least n elements.

$$n = 2^{\ell} - 1 - (2^{\ell-2} - 1)$$
$$= 2^{\ell} - \frac{2^{\ell}}{4}$$
$$= \frac{3}{4}$$