a)

Availability = t_{up} / t_{total}

A:

t_{up} = 60min – 3*30s = 58.5min

t_{total} = 60min

Availability = 58.5min / 60min =97.5%

B:

t_{up} = 60min – 30*3s = 58.5min

t_{total} = 60min

Availability = 58.5min / 60min =97.5%

b)

Given:

97.5% availability =^ 0.25% failrate

We want an availability of 99,9%, thus:

99.9% availability =^ 0.1% failrate

For each server, we get more and more availability:

$(0.\ 5\%)^n = availability_{total}$

Where n is the number of servers.

Solving the inequation:

$(0.5\%)^n <= 0.1\%$

Will resolve to the following inequation:

$n >= \log_{0.5\%}(0.1\%)$ **(as a general form:** $n >= \log_{given\%}(desired\%)$**)**

Solving this, tells us that we need 1.8 (2) servers to get this concrete availability.