Given: The initial AES key is 128 bits of all 1s. So:

$$W(0) = W(1) = W(2) = W(3) = FF FF FF$$

(1) Compute W(4) to W(7):

$$W(4) = W(0) \oplus T(W(3))$$

Using the AES key schedule, this results in:

$$W(4) = \text{E8 E9 E9 E9}$$
 $W(5) = W(1) \oplus W(4) = 17 \ 16 \ 16 \ 16$ $W(6) = W(2) \oplus W(5) = \text{E8 E9 E9 E9}$ $W(7) = W(3) \oplus W(6) = 17 \ 16 \ 16 \ 16$

So:

$$W(4) = W(6) = E8 E9 E9 E9$$

 $W(5) = W(7) = 17 16 16 16$

Also:

$$W(5) = \sim W(4)$$
 (bitwise complement)

(2) Show W(10) = W(8) and W(11) = W(9): From the key schedule:

$$W(8) = W(4) \oplus W(7)$$

 $W(9) = W(5) \oplus W(8)$
 $W(10) = W(6) \oplus W(9)$
 $W(11) = W(7) \oplus W(10)$

Since:

$$W(5) \oplus W(6) = FF FF FF FF,$$

and XORing the same value twice cancels it out:

$$W(10) = W(8)$$

$$W(11) = W(9)$$

Confirmed.