Question 8

a) $E(X) = 10 \cdot \frac{1}{2} = 5$

b) $E(X) = n \cdot p = 10 \cdot 0.6 = 6$

Question 9

Let X_1 = the total number of points you earned (total income)

X_2 = the total number of points you lost,

then $X = X_1 + X_2$.

Let X_1' = the number of times a consonant showed up

X_2' = the number of times a vowel showed up.

then $X_1 = 3 \cdot X_1'$

$X_2 = -1 \cdot X_2'$

Thus $E(X) = E(X_1) + E(X_2)$

$= 3 E(X_1') - E(X_2')$

$= 3 \cdot \frac{21}{26} \cdot n - \frac{5}{26} \cdot n = \frac{58}{26} n = \frac{29}{13} n$

Question 10

$E(X_n) = E(T - H) = E(T) - E(H)$

$= \frac{1}{2}n - \frac{1}{2}n = 0$