HW 7

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Question 8:

a) Fair coin flipped 10x. X = random variable of heads

$E(X) = ?$

$p(X \text{ heads}) = \frac{1}{2}$ ⇒ $E(x1+x2 \dots x10) = E(x1)+E(x2) \dots$

$= 10(\frac{1}{2}) = \boxed{5}$

b) Biased coin, head = 0.6 $E(x1+x2 \dots +x10) = E(x1)+E(x2) \dots +E(x10)$

$= 10(0.6) = \boxed{6}$

Question 9:

$p(X \text{ choosing vowel}) = \frac{5}{26}$; $p(X \text{ choosing consonant}) = \frac{21}{26}$

$E(x1) = 3(\frac{21}{26}) - \frac{5}{26} = \frac{29}{13}$

Since n independent rounds are played

the $\boxed{E(X_n) = (\frac{29}{13})n}$ ⇒ expected number of points

Question 10:

X_n = # of tails - # of heads in a fair coin toss

Trials denoted as X $\quad p(X \text{ tails}) = 1/2$

n = total trials $\quad p(X \text{ heads}) = 1/2$

# of heads = $n - X$

# of tails - # of heads = $X - Y = X - (n - X) = 2X - n$

$= 2E(X) - n \Rightarrow 2(\frac{1}{2})n - n$

$= \boxed{0}$