Q4) $\sum_{x=0}^{6} f(x) = 1$

$$0.9 + \sum_{x=1}^{6} \left(\frac{kc}{x}\right) = 1$$

$$0.9 + \frac{49c}{20} = 1$$

$$\frac{49c}{20} = 0.1$$

$$c = \frac{2}{49}$$

$$E(pay) = \sum_{x=1}^{6} \left(f(x) \times (x-1)\right) + 0\left(\frac{9}{10}\right)$$

$$= \frac{2}{49\times1}(1-1) + \frac{2}{49\times2}(2-1) + \dots + \frac{2}{49\times6}(6-1) + 0$$

$$= 0 + \frac{1}{49} + \frac{4}{147} + \frac{3}{98} + \frac{8}{245} + \frac{5}{1497} + 0$$

$$E(pay) = \frac{71}{490}$$

Q5) a) $f(x) = \frac{4-x}{6}$, $x = 1, 2, 3$

$$Z = u(X) = X^3$$

$z = 1^3, 2^3, 3^3$

$z = 1, 8, 27$

$h(z) = \frac{4-z^{\frac{1}{3}}}{6}$, $z = 1, 8, 27$

b) $E(Z) = \sum z\, h(z)$

$= 1 \times \frac{4-1^{\frac{1}{3}}}{6} + 8 \times \frac{4-8^{\frac{1}{3}}}{6} + 27 \times \frac{4-27^{\frac{1}{3}}}{6}$

$= \frac{3}{6} + \frac{16}{6} + \frac{27}{6}$

$= \frac{46}{6}$

$E(Z) = \frac{23}{3}$

c) $10 - E(Z) = 10 - \frac{23}{3}$

$= \frac{7}{3}$ //

Q9) a) let X be the money won in US casinos

$$P(X=1) = \frac{18}{38}$$

$$P(X=-1) = \frac{20}{38}$$

$$E(X) = \sum x\, P(X=x)$$

$$= 1\left(\frac{18}{38}\right) + (-1)\left(\frac{20}{38}\right)$$

$$= -\frac{2}{38}$$

$$E(X) = -\frac{1}{19}$$

b) let Y be the money won in ~~France~~ France ~~Casion~~ Casinos

$$P(Y=1) = \frac{18}{37}$$

$$P(Y=-1) = \frac{19}{37}$$

$$E(Y) = \sum y\, P(Y=y)$$

$$= \frac{18}{37} - \frac{19}{37}$$

$$E(Y) = -\frac{1}{37}$$