Answers to Sample problems.

(1) $\frac{\sqrt{5}-1}{3-\sqrt{5}}$.

(2) $\frac{24}{7}$.

(3) $\frac{w(1)+w(3)}{2}$.

(4) Integrate by parts twice to show that $|\rho(n)| \leq Cn^{-2}$. Use this to show that the partial sums form a Cauchy sequence.

(5) $\displaystyle\int_0^{10} \frac{(10-x)^2}{1000} e^{-x/10} dx$.

(6) $\frac{2R_n-n}{\sqrt{n}}$ converges to a standard normal random variable.

(7) $\varepsilon L^{(\varepsilon)} \Rightarrow Exp(1)$.

(8) $\frac{e^{x+1}}{e-1}$.

(9) (a) $\exp\left(-\frac{2(s-u)s}{t}\right)$; (b) $M(t) - W(t)$ has the same distribution as $|W(t)|$.

(10) (a) $f(x) = \tan^{-1} x$ if $x \geq 0$ and $f(x) = x + \frac{x^3}{3}$ if $x \leq 0$;

(b) $P(M < b) = \dfrac{3\pi}{3\pi + 6|b| + 2|b|^3}$.