Due Date: 4:00pm, November 1, 2019 (in Assignment box)

Problem 1

The CDF of random variable X is given by

$$F_X(x)=\begin{cases} 0, & x<-1, \\ \dfrac{x}{4}+\dfrac{1}{2}, & -1\le x<1, \\ 1, & x\ge 1. \end{cases}$$

(a) Sketch the CDF of X.
(b) Find $P[X<-1]$ and $P[X\le -1]$.
(c) Find $P[X<0]$ and $P[X\le 0]$.
(d) Find $P[X>1]$ and $P[X\ge 1]$.

Problem 2

For the random variable in Problem 1,
(a) Find its PDF.
(b) Find its mean.
(c) Find its standard deviation.

Problem 3

If a Gaussian random variable has mean value equal to 30 and a variance equal to 36, find
(a) the Gaussian curve area to the right of $X=17$;
(b) the Gaussian curve area to the left of $X=22$;
(c) the Gaussian curve area between $X=32$ and $X=41$;
(d) the value of X that has 80% of the Gaussian curve area to the left;
(e) the value of X that has 80.2% of the Gaussian curve area to the right;