Math 3339 Name:

HW #6

To find the numerical solutions of problems 2-4, as presented in class, you can use the statistical tables or the commands `pnorm` and `qnorm` in R.

(1)[4 Pts] let X be a continuous r.v. with pdf $f(x) = 3(1-x)^2$, $0 \leq x \leq 1$.

(a) Graph the pdf;
(a) find the mean of X;
(c) compute $P(0.1 < X < 0.5)$;
(d) compute $P(X > 0.4)$.

(2)[4 Pts] Let Z be a standard normal random variable and calculate the following probabilities, drawing pictures wherever appropriate

(a) $P(Z \leq 1)$;
(a) $P(|Z| \leq 2.5)$;
(c) $P(1.37 < Z)$;
(d) $P(-1.5 < Z < 2)$.

(3)[4 Pts] Let X be a normal random variable with mean 12 and standard deviation 3. Calculate the following probabilities

(a) $P(X \leq 4)$;
(a) $P(|X| \leq 6)$;
(c) $P(X > 4.5)$;
(d) $P(-1.5 < X < 4)$.

(4)[4 Pts] Determine the value of the constant c that makes the probability statement correct.

(a) $P(0 \leq Z \leq c) = 0.291$;
(a) $P(|Z| \leq c) = 0.668$;
(c) $P(c < Z) = 0.121$;
(d) $P(Z < c) = 0.9838$.