**MA 5230 Test 2: Review - Updated**

**Section 2.6: Moments**

1. Let $f(x) = 3e^{-3x}$ where $x > 0$.
   (a) Compute $E(X)$, $E(X^2)$ and $E(X^3)$.
   (b) Compute $VAR(X)$ and $\mu$.
2. Let $f(x) = c(x^2 + 1)$ where $0 \leq x \leq 2$.
   (a) Find $c$.
   (b) Find $P(1 < X < 2)$.
   (c) Compute $E(X)$ and $E(X^2)$.
   (d) Compute $VAR(X)$ and $\mu$.
3. For the pmf defined below answer the following questions.

| X | -1 | 0 | 1 | 2 |
|---|---|---|---|---|
| f(x) | 0.2 | c | 0.3 | 0.1 |

   (a) Find $c$.
   (b) Find $P(1 < X < 2)$.
   (c) Compute $E(X)$ and $E(X^2)$.
   (d) Compute $VAR(X)$ and $\mu$.
4. Compute the Moment generating function for $f(x) = 3e^{-3x}$ where $x > 0$.
5. Compute the Moment generating function for the discrete random variable below.

| X | 0 | 1 | 2 |
|---|---|---|---|
| f(x) | 0.2 | 0.3 | 0.5 |

6. Assume $M_X(t) = \frac{1}{1-t}$ is the moment gernrating function for some random variable $X$. Compute $\mu$ and $\sigma$.

3.2: 1,2,3-9odd,10,15,17,21,22,27

3.3: 1,3,5,6,7,9,15,16