

Name:

# MATH 320: In-Class 12

1. Suppose  $X$  has the following pmf:

$x$	4	5	6	7
$f(x)$	0.17	0.53	0.22	0.08

(a) Find the mgf  $M_X(t)$ .

(b) Find  $E(X)$  using  $M_X(t)$ .

(c) Find  $V(X)$  using  $M_X(t)$ .

2. If  $X \sim \text{Gamma}(\alpha = 4, \beta = 0.75)$ , find  $M_X(t)$ .
3. If  $X \sim \text{Exponential}(\lambda = 3)$ , use  $M_X(t)$  to show that  $E(X) = 1/3$ .
4. If  $X \sim \text{Normal}(\mu = -10, \sigma = 2)$ , find  $M_X(t)$ .
5. Using the normal distribution from problem 4, use  $M_{aX+b}(t) = e^{tb}M_X(at)$  to find the mgf of  $Y = -3X$ . What is the distribution of  $Y$ ?