

Name:

# MATH 320: In-Class 9

Answer all questions. Show your work where necessary.

1. A game is played where a fair six-sided die is first rolled. You receive a payout in the following manner:

- If 1, 2 or 3 is rolled the game pays 1 dollar.
- If a 4 or 5 is rolled the game pays 2 dollars.
- If a 6 is rolled the game pays 3 dollars.

- (a) Find the expected payout of this game by hand.

- (b) Find the variance of the payout of this game by hand and by calculator (confirm the expected value too).

2. Given pmf table for  $X$  below. Let  $Y = g(X) = \sqrt{X} + 3$ .

$x$	0	16	25
$f(x)$	0.5	0.32	0.18

- (a) Find  $E(Y)$  by hand.

- (b) Find  $SD(Y)$  using your calculator.

3. Let  $X$  have the following cdf:

$$F(x) = \begin{cases} \frac{1}{2}x^2 & 0 \leq x \leq 1 \\ 1 - \frac{1}{2x^2} & 1 < x < \infty \\ 0 & \text{otherwise} \end{cases}$$

(a) Find the difference between the 70<sup>th</sup> percentile and the 30<sup>th</sup> percentile.

(b) Find the mode of this distribution.

(c) Find  $E(X)$ .

(d) Find the expected value of  $g(X) = 15X - 3$ .