

## Math 193 – Test 3: Version A

March 17, 2017

Name: \_\_\_\_\_

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**Total: 25 points**

1. (6 points) On the most recent sailing of the BC Ferry “Spirit of BC”, 125 of the vehicles had BC licence plates, 40 were campers, and 5 were campers with BC licence plates. There were 200 vehicles in total on that ferry.

- (a) Complete the contingency table below using the above information.

	camper	not a camper
BC plates elsewhere		

- (b) Calculate the probability that a random vehicle is not a camper.

- (c) Calculate the probability that a random vehicle is a camper that does not have BC plates.

- (d) Calculate the probability that a random vehicle is a camper or has BC plates or both.

2. (4 points) A skilled marksman hits a target 91% of the time. He does not improve with practice. What is the probability that he hits the target at most 17 times on 20 attempts?

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3. (5 points) Your engineering company is considering competing for Project Alpha. The cost of competing for Project Alpha is \$35 000. You estimate that your bid has a 45% probability of success, which will mean a profit of \$180 000.
- (a) Calculate the expected earnings, where earnings = profit – cost
- (b) Your company does not like to bid on risky projects in which the standard deviation of the earnings is more than \$60 000. Should your firm bid on Project Alpha? Explain your reasoning.

4. (4 points) Suppose that some phenomenon has the following probability distribution.

$$f(x) = \begin{cases} \frac{k}{x} & \text{for } 1 \leq x \leq 10 \\ 0 & \text{otherwise} \end{cases}$$

- (a) Calculate  $k$  so that  $f(x)$  is indeed a probability distribution function. Give both an exact and an approximate answer.

- (b) Calculate the mean value of  $x$ . Give both an exact and an approximate answer.

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5. (6 points) The mean price for a barrel of crude oil in July 2014 was \$105. Let's assume that the price is normally distributed with a standard deviation of \$8.
- (a) Find the probability that the price for a barrel of crude oil is above \$100.

(b) 99.5% of the time, the price is above a certain amount. Calculate that amount.