

**Quiz 2 for Statistics 301**  
**Elementary Statistical Methods - Spring 2000**  
**Material Covered: Sections 4.1,4.2,4.3 of Workbook; Sections 4.1,4.2 of**  
**text**  
**For: Friday, 11th February**

Name (please print): \_\_\_\_\_  
last first

If  $n_H$  and  $n_T$  denote respectively the number of heads and tails in  $n$  tosses of a fair coin. For example, in  $n = 25$  tosses of a coin, it is possible that the number of heads tossed is  $n_H = 8$  (and so the number of tails tossed would have to be  $n_T = 17$  and so  $|n_H - n_T| = |8 - 17| = |-9| = 9$ ).

- (a) [2] Use the program COINTOSS from your calculator to fill in the following table.

number of tosses, $n$	$ n_H - n_T $	$\frac{ n_H - n_T }{n}$
25		
50		
75		
100		

- (b) [1] As  $n$  becomes very large (circle one)
- (i)  $|n_H - n_T|$  approaches 0.
  - (ii)  $\frac{|n_H - n_T|}{n}$  approaches 0.
  - (iii)  $|n_H - n_T|$  approaches 0 and  $\frac{|n_H - n_T|}{n}$  approaches 0.
  - (iii)  $|n_H - n_T|$  approaches 0 or  $\frac{|n_H - n_T|}{n}$  approaches 0.
- (c) [1] In three tosses of a fair coin, there are eight possible outcomes.  
 These outcomes are: \_\_\_\_\_
- (d) [1] In three tosses of a fair coin, the probability of tossing *exactly one head* is (circle one)  $\frac{1}{8} / \frac{2}{8} / \frac{3}{8} / \frac{4}{8} / \frac{5}{8}$ .
- (e) [1] A fair coin is tossed three times. Let event A be *at least one head is tossed*, event B be *at least two tails are tossed* and event C be *at most one head is tossed*. Then

$P(\text{A and B or C}) = \underline{\hspace{2cm}}$

- (a) [2] Use the program COINTOSS from your calculator to fill in the following table.

number of tosses, $n$	$ n_H - n_T $	$\frac{ n_H - n_T }{n}$
25	7	0.28
50	2	0.04
75	3	0.04
100	24	0.24

- (b) [1] (ii)

- (c) [1] HHH, HHT, HTH, HTT, THH, THT, TTH, TTT

- (d) [1]  $\frac{3}{8}$

- (e) [1]  $\frac{3}{8}$  (since (HHH, HHT, HTH, HTT, THH, THT, TTH) and (HTT, THT, TTH, TTT) or (TTT))