

CONDITIONAL PROBABILITY

TEXT: 3.2, 3.3

LAST NAME	FIRST NAME	DATE
-----------	------------	------

1 (6 points). Suppose that a sample of young galaxies yields the following contingency table.

	Spiral	Elliptical	Lenticular	Total
Active	9	1	0	
Inactive	3	1	6	
Total				

The experiment is to choose one of these galaxies at random. For each of the following events, write it down formally, and compute its probability.

(a) The chosen galaxy is active, given it is a spiral.

(b) The chosen galaxy is elliptical, given it is **not** an active spiral.

(c) Are the events Active and Elliptical mutually exclusive? **Yes / No**

(d) Are the events Active and Elliptical independent? Explain. **Yes / No**

(e) Are the events Active and Lenticular mutually exclusive? **Yes / No**

(f) Are the events Active and Lenticular independent? Explain. **Yes / No**

2 (4 points). Roll a fair 12-sided die with numbers 1 through 12, assume all outcomes are equally likely.

- (a) How likely is the number to be prime?

- (b) How likely is the number to be even?

- (c) How likely is the number to be prime, given it's even?

- (d) How likely is the number to be even, given it's prime?

- (e) Are the events *prime* and *even* mutually exclusive?

- (f) Are the events *prime* and *even* independent? Explain.

3 (2 points). A basket contains 7 yellow apples and 4 red apples. Margo picks two apples without looking.

- (a) What is the probability she picks 2 yellow apples?

- (b) What is the probability she gets both colors?