25th November

Completed Exercises from the lecture on

< Conditional Probability >

L. Hard, Pages 2-7 ;

Can be found below.

Hard

(1) **e29586d5** SHORT ANSWER Case-Insensitive

Number of Contestants by Score and Day

	5 out of 5	4 out of 5	3 out of 5	2 out of 5	1 out of 5	0 out of 5	Total
Day 1	2	3	4	6	2	3	20
Day 2	2	3	5	5	4	1	20
Day 3	3	3	4	5	3	2	20
Total	7	9	13	16	9	6	60

The same 20 contestants, on each of 3 days, answered 5 questions in order to win a prize. Each contestant received 1 point for each correct answer. The number of contestants receiving a given score on each day is shown in the table above. No contestant received the same score on two different days. If a contestant is selected at random, what is the probability that the selected contestant received a score of 5 on Day 2 or Day 3, given that the contestant received a score of 5 on one of the three days?

$\frac{5}{7}$

7 : got 5

(2) **d4413871** SHORT ANSWER Case-Insensitive

	Blood type			
Rhesus factor	A	B	AB	0
+	33	9	3	37
-	7	2	1	x

Human blood can be classified into four common blood types-A, B, AB, and O . It is also characterized by the presence (+) or absence (−) of the rhesus factor. The table above shows the distribution of blood type and rhesus factor for a group of people. If one of these people who is rhesus negative (−) is chosen at random, the probability that the person has blood type B is $\frac{1}{9}$. What is the value of x ?

8

2 is $\frac{1}{9}$th ⇒ 18 People in total

$7 + 2 + 1 + x = 18$

(3) **6626cac3** SHORT ANSWER Case-Insensitive

	Phone	Email
Dinner dance	55%	80%
Football game	20%	10%
Picnic	20%	5%
Pool party	5%	5%
Total	100%	100%

An alumni association survey asked each high school graduate to select the one activity he or she preferred for the association's next event. Some of the people responded by phone, and the others responded by email. The table above shows the distribution of preferred activity, in percent, for each response type used. For the survey, the number of email responses was twice the number of phone responses. If a person who preferred a picnic is selected at random, what is the probability that the person responded by email?

$\frac{1}{3}$

$20\% \cdot P + 2P \cdot 5\% = 30P\%$

$\frac{20\%P}{30\%P} = \frac{1}{3}$

(5) **6a715bed** SHORT ANSWER Case-Insensitive

The table summarizes the distribution of age and assigned group for 90 participants in a study.

	$0-9$ years	$10-19$ years	$20+$ years	Total
Group A	7	14	9	30
Group B	6	4	20	30
Group C	17	12	1	30
Total	30	30	30	90

0.40

One of these participants will be selected at random. What is the probability of selecting a participant from group A , given that the participant is at least 10 years of age? (Express your answer as a decimal or fraction, not as a percent.)

$$\frac{\text{ppl Gr A}}{\text{ppl} > 10} = \frac{23}{60}$$

23/60

.3833

(6) **5dc386fb** MULTIPLE CHOICE One answer only

The table below shows the distribution of US states according to whether they have a state-level sales tax and a statelevel income tax.

State income tax

No state income tax

2013 State-Level Taxes

	State sales tax
No state sales tax	
~~State income tax~~ 4	39
~~No state income tax~~ 1	6

To the nearest tenth of a percent, what percent of states with a state-level sales tax do not have a state-level income tax?

a. 12.0%
b. 13.3%
c. 14.0%
d. 6.0%

$\frac{6}{39+6} = \frac{6}{45} \approx 13.3\%$

(7) **ecd09c38** MULTIPLE CHOICE One answer only

Employees working for a customer service line at an electric company recorded all the calls last Monday and noted whether the caller asked for repairs and whether the caller asked about a bill. The results are summarized in the table below.

	Asked for repairs	Did not ask for repairs	Total
Asked about a bill	48	623	671
Did not ask about a bill	130	90	220
Total	178	713	891

If a caller last Monday who asked about his or her bill is selected at random, which of the following is closest to the probability that the customer also asked for repairs?

a. 0.05
b. 0.20
c. 0.07
d. 0.27

$\frac{48}{671}$

Total of marks: 29