MATH 311 – REVIEW EXAM 2

28.2
Using addition to find OR probability (being careful not to double count)
P(A or B) = P(A) + P(B) – P(A and B) – always works but can be modified
Tree diagrams
Two – dice outcomes (28.1)

28.3
Disjoint / mutually exclusive events
P(A and B) = 0 ***if A and B are disjoint***
P(A | B) = 0 ***if A and B are disjoint***
Independent events
P(A and B) = P(A) x P(B) ***if A and B are independent***
P(A | B) = P(A) ***if A and B are independent***
Finding probability of multiple independent events using multiplication

28.4
Finding conditional probability: P(A | B)
Finding probability using contingency tables
Finding probability for dependent situations using tree diagrams
Reasoning for dependent situations
P(A and B) = P(A) x P(B | A) = P(B) x P(A | B) ***if A and B are dependent***
Finding probability of multiple dependent events using multiplication

REVIEW PROBLEMS FOR EXAM 2

1. In an aquarium there are 200 fish. There are 90 tetra (T) and the rest are goldfish (G). Two-thirds of the tetra and half of the goldfish are female. Complete the contingency table with this information.

	Female (F)	Male (M)	Total
Tetra (T)			
Goldfish (G)			
Total			

Find:

P(G and F) = _____ P(not F) = _____

P(G or F) = _____ P(not G) = _____

P(G | F) = _____ P(F | G) = _____

2. Let P(A) = 0.3 and P(B) = 0.6 and P(A | B) = 0.5, use this to find the following:

P(A and B) = _____ P(A or B) = _____

Are A and B disjoint events? YES NO Explain

Are A and B independent events? YES NO Explain

3. A fair coin is tossed six times. Which of the following outcomes is most likely in each pair. Explain.
   a. TTHTTH or THTHTH?

   b. Some combination of 3H and 3T or all tails?

4. Find the theoretical probability of each of the following:

   a. P(3 tails when tossing 3 coins) = _____

   b. P(a multiple of 3, 3 times in a row on a standard die) = _____

   Suppose that we have a bag containing 3 green and 2 red balls – the experiment is to draw without replacement between the draws.

   c. P(drawing 3 green balls in a row) = _____

   d. P(drawing 3 red balls in a row) = _____

   e. P(drawing 2 green, then one red ball) = _____

REVIEW PROBLEMS FOR EXAM 2

1. In an aquarium there are 200 fish. There are 90 tetra (T) and the rest are goldfish (G). Two-thirds of the tetra and half of the goldfish are female. Complete the contingency table with this information.

	Female (F)	Male (M)	Total
Tetra (T)	60	30	90
Goldfish (G)	55	55	110
Total	115	85	200

Find:

P(G and F) = 55/200 P(not F) = 85/200

P(G or F) = 170/200 P(not G) = 90/200

P(G | F) = 55/115 P(F | G) = 55/110

2. Let P(A) = 0.3 and P(B) = 0.6 and P(A | B) = 0.5, use this to find the following:

P(A and B) = (.6)(.5) = .3 P(A or B) = .3 + .6 − .3 = .6

Are A and B disjoint events? YES (NO) Explain

P(A|B) ≠ 0 OR P(A and B) = .3 ≠ 0

Are A and B independent events? YES (NO) Explain

P(A|B) ≠ P(A) OR P(A and B) = .3 ≠ (.3)(.6)

3. A fair coin is tossed six times. Which of the following outcomes is most likely in each pair. Explain.

a. TTHTTH or THTHTH? Both equally likely - ordered outcomes

b. Some combination of 3H and 3T or all tails? grouped outcomes

4. Find the theoretical probability of each of the following:

a. P(3 tails when tossing 3 coins) = 1/2 · 1/2 · 1/2 = 1/8

b. P(a multiple of 3, 3 times in a row on a standard die) = 2/6 · 2/6 · 2/6 = 8/216 = 1/27

Suppose that we have a bag containing 3 green and 2 red balls – the experiment is to draw without replacement between the draws.

c. P(drawing 3 green balls in a row) = 3/5 · 2/4 · 1/3 = 6/60 = 1/10

d. P(drawing 3 red balls in a row) = 2/5 · 1/4 · 0 = 0

e. P(drawing 2 green, then one red ball) = 3/5 · 2/4 · 2/3 = 12/60 = 1/5