

SM2 Chapter 5 Practice Test

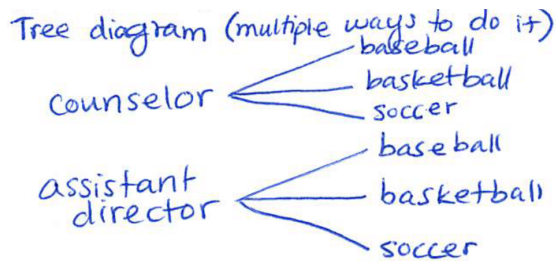
Probability and Statistics

Name _____

Period _____ Date _____

Represent the sample space for the following by writing it as a set AND by making a tree diagram.

1) Jeremy could go to baseball, basketball, or soccer camp as a counselor or an assistant director.



set:
 $\{\text{baseball counselor, basket b. couns., soccer couns., basketb. A.D., base b. A.D., soccer A.D.}\}$

Find the number of possible outcomes for each situation (#2-3).

2) Eva is shopping for school supplies. She has a choice of one of each of the following: 6 backpacks, 8 notebooks, 3 pencil cases, 3 brands of pencils, 8 brands of pens, 4 types of calculators, and 4 colors of highlighters. How many different choices does she have for school supplies?

55,296

3) Chloe is buying a laptop. She has a choice of 3 hard drive sizes, 3 processor speeds, 4 colors, 2 screen sizes, 2 warranty options, and 4 cases. She knows she wants a blue laptop with the longest warranty. How many choices does she have for laptops if she gets a blue one with the longest warranty?

72

4) When two six-sided dice are rolled, there are 36 possible outcomes.

a. Find the probability that the sum is 5.

$$\frac{1}{9} \text{ (about 11.1\%)}$$

b. Find the probability that the sum is not 5.

$$\frac{8}{9} \text{ (about 88.9\%)}$$

c. Find the probability that the sum is less than or equal to 5.

$$\frac{5}{18} \text{ (about 27.8\%)}$$

d. Find the probability that the sum is less than 5.

$$\frac{1}{6} \text{ (about 16.7\%)}$$

6) A manufacturer tests 900 dishwashers and finds that 24 of them are defective. Find the probability that a dishwasher chosen at random has a defect. An apartment building orders 40 of the dishwashers. Predict the number of dishwashers in the apartment with defects.

$$P(\text{defect}) = \frac{2}{75} \text{ (about 0.027)}$$

Prediction for defective parts out of 40: 1 (rounded from 1.07)

Tell whether the events are independent or dependent. Explain your reasoning.

- 7) You and a friend are picking teams for a softball game. You randomly choose a player. Then your friend randomly chooses a player.

Event A: You choose a pitcher. **Event B:** Your friend chooses a first baseman.

Dependent. Your friend can't choose the same person for first baseman that you chose for pitcher (the player is not "put back") so the pick of the first player does affect the pick of the second.

- 8) You are making bracelets for party favors. You randomly choose a charm and a piece of leather.

Event A: You choose heart-shaped charm first. **Event B:** You choose a brown piece of leather second.

Independent. The pick of a charm does not affect the pick of a piece of leather.

Determine whether the events are independent or dependent. Then find the probability.

- 9) A sack contains the 26 letters of the alphabet, each printed on a separate wooden tile. You randomly draw one letter, and then you randomly draw a second letter. Find the probability of each pair of events.

- a. You replace the first letter before drawing the second letter.

Event A: The first letter drawn is T. **Event B:** The second letter drawn is A.

Independent $\frac{1}{676}$ (about 0.001 or 0.1%)

- b. You do not replace the first letter tile before drawing the second letter tile.

Event A: The first letter drawn is P. **Event B:** The second letter drawn is S.

Dependent $\frac{1}{650}$ (about 0.002 or 0.2%)

- 10) In a game, two dice are tossed and both roll a six.

Independent $\frac{1}{36}$ (about 2.8%)

- 11) From a standard deck of 52 cards, a king is drawn and not put back in the deck. Then a second king is drawn.

Dependent $\frac{1}{221}$ (about 0.45%)

- 12) From a drawer of 8 blue socks and 6 black socks, a blue sock is drawn and put back. Then another blue sock is drawn.

Independent $\frac{16}{49}$ (about 32.7%)

- 13) Mina wants to buy a drink from a vending machine. In her pocket are 2 nickels, 3 quarters, and 5 dimes. What is the probability she first pulls out a quarter and then another quarter?

Dependent $\frac{1}{15}$ (about 6.7%)

Determine the probability of each event.

14) If the chance of being selected for the student bailiff program is 1 in 200, what is the probability of not being chosen?

$$\frac{199}{200} \quad (99.5\%)$$

15) If you have a 40% chance of making a free throw, what is the probability of missing a free throw?

$$60\% \quad (\text{or } \frac{3}{5})$$

16) Jeanie bought 10 raffle tickets. If 250 were sold, what is the probability that one of Jeanie's tickets will not be selected?

$$\frac{24}{25} \quad (96\%)$$

Complete the two-way table.

17)

		Ran a Half Marathon		
		Yes	No	Total
Role	Student	12	112	124
	Teacher	7	151	158
	Total	19	263	282

18)

		Surfing Style		
		Regular	Advanced	Total
Gender	Male	86	24	110
	Female	77	18	95
	Total	163	42	205

Use the following table to complete part a.

19)

		Fishing License		
		Yes	No	Total
Hunting License	Yes	65	37	102
	No	177	341	518
	Total	242	378	620

a.) Make a two-way table that shows the joint and marginal relative frequencies.

		Fishing License		
		Yes	No	Total
Hunting License	Yes	0.105	0.060	0.165
	No	0.285	0.55	0.835
	Total	0.390	0.610	1

20) Evaluate the expression. SHOW YOUR WORK. (or use calculator)

a. ${}_{10}P_7$

$$604,800$$

b. ${}_{10}C_4$

$$210$$

c. ${}_{14}C_8$

$$3003$$

d. ${}_{11}P_0$

$$1$$

State whether the following is a permutation or combination situation. Then find the number of possibilities.

21) Student ID numbers are 4 digits long selected from the 10 possible digits from 0 to 9. Digits cannot be repeated. How many possible identification numbers are there?

$$\text{Permutation } 5040$$

22) In chemistry lab, you need to test six samples of the twelve (your lab partner will test the rest) for your table. How many ways can you select six different samples, without testing the same sample twice?

Combination 924

State whether the situation is a permutation or combination. Then calculate the probability.

23) What is the probability that Cecilia, Annie, and Kimi are the first three gymnasts to perform their floor routine of the top seven?

Combination $\frac{1}{35}$

24) What is the probability that after all seven gymnasts perform, that Annie will get first, Cecilia will get second place, and Kimi third?

Permutation $\frac{1}{210}$

25) What is the probability that in a row of 8 pool balls, the solid 2 and the striped 11 would be first and second from the left?

Permutation $\frac{1}{56}$

26) If you randomly place 24 photos in a photo album and you can place four photos on the first page, what is the probability that you choose the four oldest photos?

Combination $\frac{1}{10626}$

27) Complete the two-way frequency table for the activities chosen by 74 teenagers on an activity holiday.

	Rock Climbing	Mountain Climbing	Totals
Boys	42	5	47
Girls	7	20	27
Totals	49	25	74

28) What is the probability that a randomly chosen teenager is a girl chose mountain climbing?

$$\frac{10}{37} \approx 0.270$$

29) What is the probability that a randomly selected teenager chose rock climbing?

$$\frac{49}{74} \approx 0.662$$

30) What is the probability that a randomly selected boy chose rock climbing?

$$\frac{42}{47} \approx 0.894$$

31) What is the probability that a randomly selected teen who chose mountain climbing is a girl?

$$\frac{4}{5} \text{ or } 0.8$$