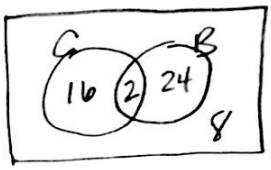
Accelerated Geometry
Test Review

Name Key
Date

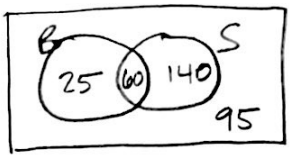
1. In a class of 50 students, 18 take Chorus, 26 take Band, and 2 take both Chorus and Band. How many students in the class are not enrolled in either Chorus or Band?

8



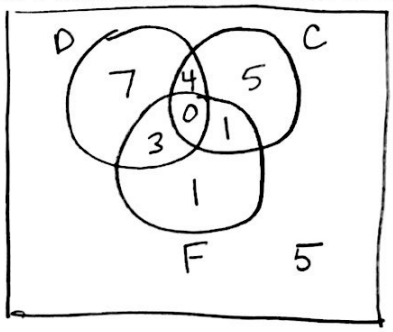
2. In a school of 320 students, 85 students are in the band, 200 students are on sports teams, and 60 students participate in both activities. How many students are involved in either band or sports?

225



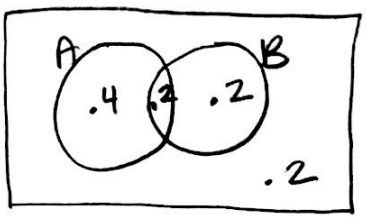
3. A veterinarian surveys 26 of his patrons. He discovers that 14 have dogs, 10 have cats, and 5 have fish. Four have dogs and cats, 3 have dogs and fish, and one has a cat and fish. If no one has all three kinds of pets, how many patrons have none of these pets?

5



4. Consolidated Builders has bid on two large construction contracts. The company president believes that the probability of winning the first contract (event A) is 0.6, that the probability of winning a second contract (event B) is 0.4 and the probability of winning both jobs is 0.2.

a) Draw a Venn Diagram that shows the relation between events A and B from part (a). Label the probabilities for each event on the diagram. (Hint: your probabilities should sum to 1)

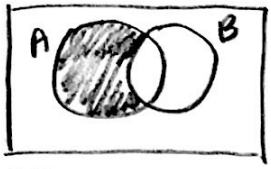


b) What is the probability of the event {A or B}?

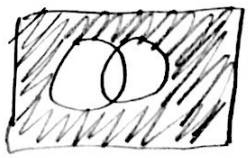
0.8

c) Draw and shade a Venn Diagram that represents the event that Consolidated wins the first job but not the second. What is the probability of this happening?

0.4



d) Draw and shade a Venn Diagram that represents the event that Consolidated does not win either job. What is the probability of this happening?



0.2

5. A single coin is tossed twice. Event A is having the coin land heads up on the first toss. Event B is having the coin land tails up on the second toss.

Are the two events independent or dependent? Independent

Find P(A and B) $\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = 1/4$

6. Two cards are drawn from a standard 52 card deck. The first card is not placed back in the deck before the second card is drawn. Event A is drawing a queen for the first card. Event B is drawing a king for the second card.

Are the two events independent or dependent? Dependent

Find P(A and B) $\left(\frac{4}{52}\right)\left(\frac{4}{51}\right) = \frac{16}{2652}$

7. Two cards are drawn from a standard deck of 52 cards. The first card is placed back into the deck before the second card is drawn. Event A is drawing a queen for the first card. Event B is drawing a king for the second card.

Are the two events independent or dependent? Independent

Find P(A and B) $\left(\frac{4}{52}\right)\left(\frac{4}{52}\right) = \frac{16}{2704}$

8. A jar contains 12 red marbles, 16 blue marbles and 18 white marbles. 46 total

A) Three marbles are chosen from the jar without replacement. What is the probability that **none** is white?

$$\left(\frac{28}{46}\right)\left(\frac{27}{45}\right)\left(\frac{26}{44}\right) = \frac{19656}{91080} = 0.22$$

B) Four marbles are chosen from a jar without replacement. What is the probability that **all** are white?

$$\left(\frac{18}{46}\right)\left(\frac{17}{45}\right)\left(\frac{16}{44}\right)\left(\frac{15}{43}\right) = \frac{73440}{3916440} = 0.02$$

C) What is the probability of drawing a red marble, then a blue marble with replacement?

$\left(\frac{12}{46}\right)\left(\frac{16}{46}\right) = \frac{192}{2116}$

D) What is the probability of drawing a red marble, then white, then blue with replacement?

$\left(\frac{12}{46}\right)\left(\frac{18}{46}\right)\left(\frac{16}{46}\right) = \frac{3456}{97336}$

9. If the probability that person *A* will be alive in 20 years is 0.7 and the probability that person *B* will be alive in 20 years is 0.5, what is the probability that they will both be alive in 20 years?

$P(A \text{ and } B) = (0.7)(0.5) = .35$

10. If the independent probabilities that three people A, B and C will be alive in 30 years time are 0.4, 0.3, 0.2 respectively, calculate the probability that in 30 years' time,

(a) all will be alive $(0.4)(.3)(.2) = .024$

(b) none will be alive $(.6)(.7)(.8) = .336$

(c) at least one will be alive $1 - P(\text{none alive}) = 1 - .336 = .664$

10 total

11. A bag contains 5 white marbles, 3 black marbles and 2 green marbles. In each draw, a marble is drawn from the bag and not replaced. In three draws, find the probability of obtaining white, black and green in that order.

$\left(\frac{5}{10}\right)\left(\frac{3}{9}\right)\left(\frac{2}{8}\right) = \frac{30}{720}$

12. A card is randomly selected from a standard deck of 52 cards. What is the probability that it is an ace *or* a face card?

$P(\text{A or face card}) = P(\text{ace}) + P(\text{face card})$

$= \frac{4}{52} + \frac{12}{52} = \frac{16}{52}$

13. A card is randomly selected from a standard deck of 52 cards. What is the probability that the card is a heart *or* a face card?

$\frac{13}{52} + \frac{12}{52} - \frac{3}{52} = \frac{22}{52}$

14. One six-sided die is rolled. What is the probability of rolling a multiple of 3 or a multiple of 2?

$$\frac{2}{6} + \frac{3}{6} - \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$$

15. In an exam, two reasoning problems, 1 and 2, are asked. 35% students solved problem 1 and 15% students solved both the problems. How many students who solved the first problem will also solve the second one?

$$P(2^{nd} \mid 1^{st}) = \frac{P(1^{st} \text{ and } 2^{nd})}{P(1^{st})} = \frac{.15}{.35} = .43$$

16. Out of 50 people surveyed in a study, 35 subscribe to Amazon Prime. Of those 35, 20 are male. What is the probability the person surveyed is male, given that they are an Amazon Prime subscriber?

$$P(M \mid A) = \frac{P(\text{male and Amazon})}{P(\text{Amazon})} = \frac{20/50}{35/50} = \frac{20}{35}$$

17. The probability of raining on Sunday is 0.07. If today is Sunday, then find the probability of rain today.

$$P(\text{Rain} \mid \text{Sunday}) = \frac{P(\text{rain and Sunday})}{P(\text{Sunday})} = \frac{.07}{1/7} = .49$$

18. 80 students each study one of three languages.

The two-way table shows some information about these students.

	French	German	Spanish	Total
Female	15	11	13	39
Male	16	17	8	41
Total	31	28	21	80

(a) What is the probability that the student picked studies French? $31/80$

(b) What is the probability that the student studies French or German, given that they're male? $33/41$

(c) What is the probability that a Female is a Spanish student? $13/39$

(d) What is the probability of choosing a Male or a French student? $\frac{41}{80} + \frac{31}{80} - \frac{16}{80} = \frac{56}{80}$

(e) Are the events Female and Spanish independent?

$$P(F \text{ and } S) \stackrel{?}{=} P(F) \cdot P(S)$$

$$\frac{13}{80} \neq \frac{39}{80} \cdot \frac{21}{80}$$

No, they are not independent

19. 53 students attend an after-school club and are able to choose from 3 activities: Football, Tennis or Running. There are 24 boys. 22 students chose Football, of which 8 were girls. 8 boys chose tennis. 12 girls choose running.

a) Draw a two-way table to show this data.

b) How many students chose running? 14

c) A student is chosen at random. What is the probability that a boy who chooses running is picked? 2/53

d) What is the probability that a girl is chosen, given that the student plays football? 8/22

e) Are the events Boy and Tennis independent? $P(B \text{ and } T) \stackrel{?}{=} P(B) \cdot P(T)$

$8/53 \neq (24/53)(17/53)$

No, they are not independent

	Football	Tennis	Running	Total
Boy	14	8	2	24
Girl	8	9	12	29
Total	22	17	14	53