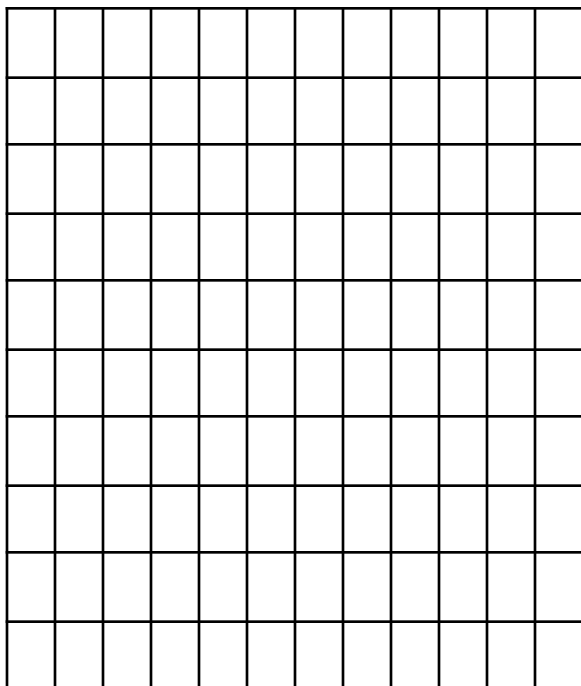


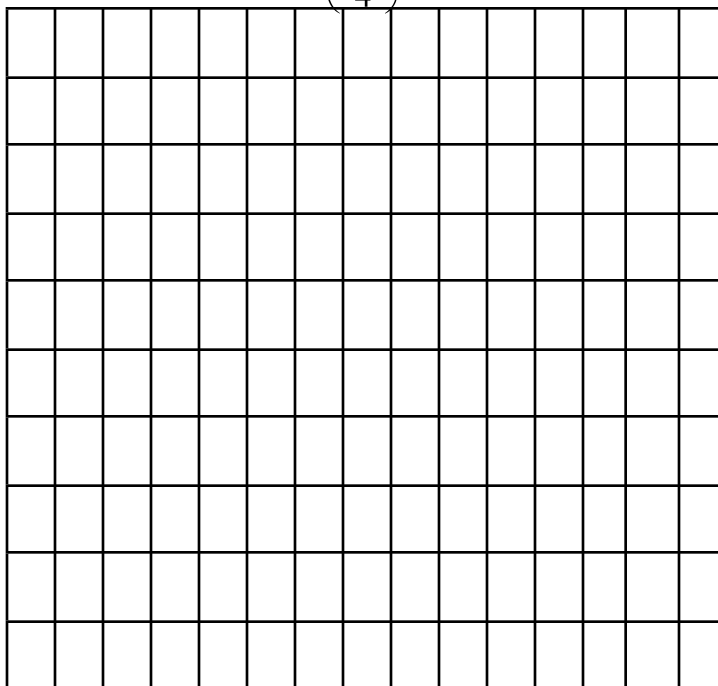
Review Section

Sketch the graph of the following:

1. $y = 2 \cos(3x)$



2. $y = 3 - \sin\left(\frac{\pi x}{4}\right)$



Find the exact value of

4) $\sin(120^\circ)$

5) $\cos(225^\circ)$

6) $\tan(330^\circ)$

7) $\csc\left(\frac{\pi}{4}\right)$

8) $\cos\left(\frac{5\pi}{6}\right)$

9) $\cot\left(\frac{4\pi}{3}\right)$

10) Simplify the following: $\frac{\frac{x}{2} - 2}{x - 4}$

Probability Section

In Exercises 1 and 2, events A and B are disjoint. Find $P(A \text{ or } B)$.

1. $P(A) = 0.4, P(B) = 0.2$

2. $P(A) = \frac{1}{3}, P(B) = \frac{1}{2}$

3. At the high school swim meet, you and your friend are competing in the 50 Freestyle event. You estimate that there is a 40% chance you will win and a 35% chance your friend will win. What is the probability that you or your friend will win the 50 Freestyle event?

In Exercises 4 and 5, you roll a die. Find $P(A \text{ or } B)$.

4. Event A : Roll a 2.

5. Event A : Roll an even number.

Event B : Roll an odd number.

Event B : Roll a number greater than 3.

6. You bring your cat to the veterinarian for her yearly check-up. The veterinarian tells you that there is a 75% probability that your cat has a kidney disorder or is diabetic, with a 40% chance it has a kidney disorder and a 50% chance it is diabetic. What is the probability that your cat has both a kidney disorder and is diabetic?

7. A game show has three doors. A Grand Prize is behind one of the doors, a Nice Prize is behind one of the doors, and a Dummy Prize is behind one of the doors. You have been watching the show for a while and the table gives your conditional estimates of the probabilities for the given scenarios.

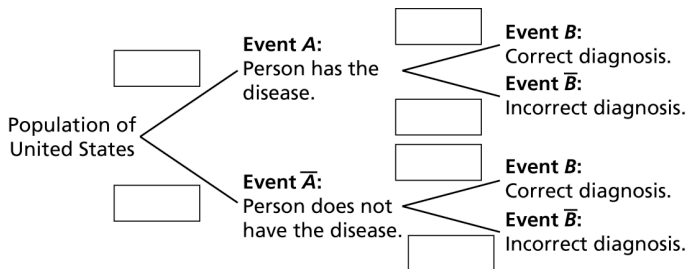
	Door 1	Door 2	Door 3
Grand Prize	0.25	0.45	0.3
Nice Prize	0.4	0.25	0.35
Dummy Prize	0.35	0.3	0.35

- Find the probability that you win either the Grand Prize or a Nice Prize if you choose Door 1
- Find the probability that you win either the Grand Prize or a Nice Prize if you choose Door 2
- Find the probability that you win either the Grand Prize or a Nice Prize if you choose Door 3
- Which door should you choose? Explain.

8. You are performing an experiment to determine how well pineapple plants grow in different soils. Out of the 40 pineapple plants, 16 are planted in at least some sandy soil, 18 are planted in at least some potting soil, and 7 are planted in a mixture of sandy soil and potting soil. What is the probability that a pineapple plant in the experiment is planted in sandy soil or potting soil?

9. An Educational Advisor estimates that there is a 90% probability that a freshman college student will take either a mathematics class or an English class, with an 80% probability that the student will take a mathematics class and a 75% probability that the student will take an English class. What is the probability that a freshman college student will take both a mathematics class and an English class?

10. A test diagnoses a disease correctly 92% of the time when a person has the disease and 80% of the time when the person does not have the disease. Approximately 4% of people in the United States have the disease. Fill in the probabilities along the branches of the probability tree diagram and then determine the probability that a randomly selected person is correctly diagnosed by the test.



Which is independent? Which not? Prove.

	Cats	Dogs	
Fun	10	15	
Serious	12	18	

11) Are type of pet and type of personality Independent? Show evidence.

Weight (lbs)	$x < 10$	$10 < x < 20$	$x > 20$	
Cats	20	12	10	
Dogs	15	12	20	

12) Are type of pet and size of pet independent? Show evidence.

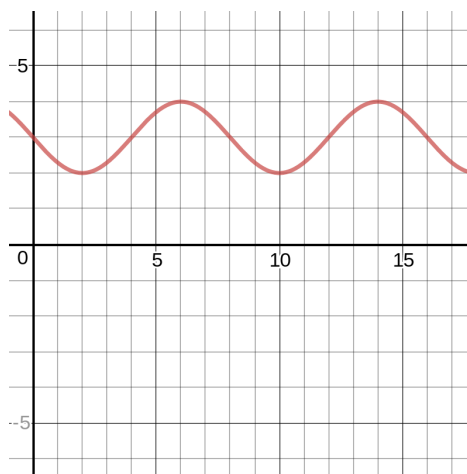
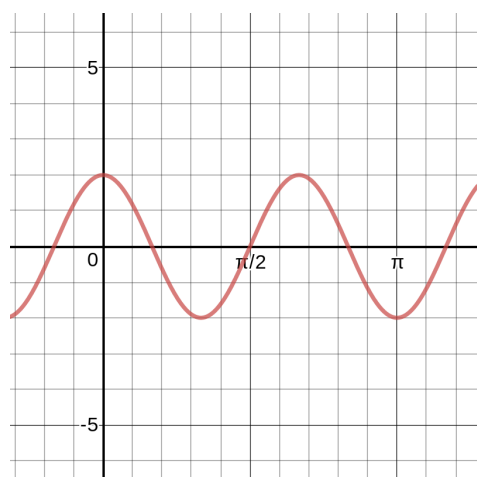
13) Make a Venn Diagram for the first table.. $P(\text{Cat}) =$ $P(\text{Cat and Fun}) =$ $P(\text{Cat}|\text{Fun}) =$

Review Section - Answers

Sketch the graph of the following:

1. $y = 2 \cos(3x)$

2. $y = 3 - \sin\left(\frac{\pi x}{4}\right)$



Find the

exact value of

4) $\sin(120^\circ) = \frac{\sqrt{3}}{2}$

5) $\cos(225^\circ) = -\frac{\sqrt{2}}{2}$

6) $\tan(330^\circ) = -\frac{\sqrt{3}}{3}$

7) $\csc\left(\frac{\pi}{4}\right) = \sqrt{2}$

8) $\cos\left(\frac{5\pi}{6}\right) = -\frac{\sqrt{3}}{2}$

9) $\cot\left(-\frac{4\pi}{3}\right) = \frac{\sqrt{3}}{3}$

10) $\frac{\frac{x}{2} - 2}{x - 4} = \frac{\frac{\sqrt{3}}{2}}{x - 4} = \frac{1}{2}$

Probability Section

In Exercises 1 and 2, events A and B are disjoint. Find $P(A \text{ or } B)$.

1. $P(A) = 0.4, P(B) = 0.2$

$P(A \cup B) = 0.6$

2. $P(A \cup B) = \frac{5}{6}$

$P(A) = \frac{1}{3}, P(B) = \frac{1}{2}$

3. At the high school swim meet, you and your friend are competing in the 50 Freestyle event. You estimate that there is a 40% chance you will win and a 35% chance your friend will win. What is the probability that you or your friend will win the 50 Freestyle event? $0.4 + 0.35 = 0.75$

In Exercises 4 and 5, you roll a die. Find $P(A \text{ or } B)$.

4. Event A : Roll a 2. Event B : Roll an odd number.

$P(A \text{ or } B) = 4/6$

$P(A \text{ or } B) = 2/3$

5. Event A : Roll an even number. Event B : Roll a number greater than 3.

6. You bring your cat to the veterinarian for her yearly check-up. The veterinarian tells you that there is a 75% probability that your cat has a kidney disorder or is diabetic, with a 40% chance it has a kidney disorder and a 50% chance it is diabetic. What is the probability that your cat has both a kidney disorder and is diabetic? $P(K \cap D) = 0.15$

	Diabetes	NOT
Kidney Problems	0.15	0.25
NOT	0.35	0.25

7. A game show has three doors. A Grand Prize is behind one of the doors, a Nice Prize is behind one of the doors, and a Dummy Prize is behind one of the doors. You have been watching the show for a while and the table gives your estimates of the probabilities for the given scenarios

	Door 1	Door 2	Door 3
Grand Prize	0.25	0.45	0.3
Nice Prize	0.4	0.25	0.35
Dummy Prize	0.35	0.3	0.35

- a. Find the probability that you win either the Grand Prize or a Nice Prize if you choose Door 1. $P(W|1) = 0.65$
b. Find the probability that you win either the Grand Prize or a Nice Prize if you choose Door 2. $P(W|2) = 0.70$
c. Find the probability that you win either the Grand Prize or a Nice Prize if you choose Door 3. $P(W|3) = 0.65$
d. Which door should you choose? Explain. Door 2 is best at getting Grand Prize of first 2 prizes

8. You are performing an experiment to determine how well pineapple plants grow in different soils. Out of the 40 pineapple plants, 16 are planted in at least some sandy soil, 18 are planted in at least some potting soil, and 7 are planted in a mixture of sandy soil and potting soil. What is the probability that a pineapple plant in the experiment is planted in sandy soil or potting soil?

	Sandy	NOT
Potting	7	11
NOT	9	13

$$P(S \cup P) = P(S) + P(P) - P(S \cap P) = 27/40 = .675$$

9. An Educational Advisor estimates that there is a 90% probability that a freshman college student will take either a mathematics class or an English class, with an 80% probability that the student will take a mathematics class and a 75% probability that the student will take an English class. What is the probability that a freshman college student will take both a mathematics class and an English class? $P(\text{Math AND Eng}) = 0.65$

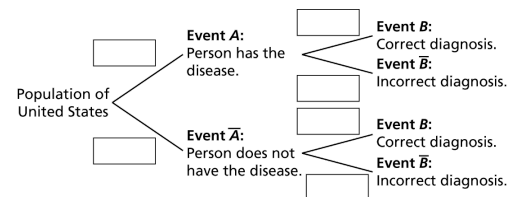
	Math	NOT
Englisg	0.65	0.1
NOT	0.15	0.1

10. A test diagnoses a disease correctly 92% of the time when a person has the disease and 80% of the time when the person does not have the disease. Approximately 4% of people in the United States have the disease. Fill in the probabilities along the branches of the probability tree diagram and then determine the probability that a randomly selected person is correctly diagnosed by the test.

$$P(\text{negative and well}) = .96 * .92 = 0.8832$$

$$P(\text{positive and sick}) = .04 * .80 = 0.0320$$

$$P(\text{correct}) .8832 + .032 = 0.9152$$



Which is independent? Which not? Prove.

	Cats	Dogs	
Fun	10	15	
Serious	12	18	

Weight (lbs)	$x < 10$	$10 < x < 20$	$x > 20$	
Cats	20	12	10	
Dogs	15	12	20	

11) Are type of pet and type of personality

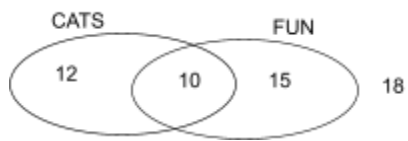
Independent? Show evidence.

$$P(C \text{ and } F) = P(C)P(F) \rightarrow 10/55 = 22/55 * (25/55)$$

12) Are type of pet and size of pet independent?

Show evidence. $P(C \text{ and } <10) = P(C)P(<10)$

$$20/89 \text{ not equal to } 42/89 (35/89)$$



13) Make a Venn Diagram for the first table.. $P(\text{Cat}) = 22/55 = 0.4$
 $P(\text{Cat and Fun}) = 10/55$ $P(\text{Cat}|\text{Fun}) = 10/25 = 0.4$

$P(\text{Cat}$