PSD 503

NAM	E:		PD:
(R) = Review		(F) = Focus	(S) = Secondary
(R)	Determine the probat	pility of a simple event (PSD 403)	
(F)	Compute straightforv	vard probabilities for common situa	ations (PSD 503)
(S)	Compute a probability	y when the event and/or sample spa	ice are not given or obvious (PSD 604)

1. (R) What is the probability that a spinner will land in region C?



- 2. (R) What is the probability of randomly selecting the Ace of Spades from a standard deck of playing cards?
- 3. (R) What is the probability of rolling a 7 on a six-sided die?
- 4. (F) What is the probability of rolling a number less than 5 on a six-sided die?
- 5. (F) There are 13 different values of cards in a standard deck: Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, and King. Each of these values appears in a deck four times: once each in Hearts (red), Spades (black), Clubs (black), and Diamonds (red). Jacks, Queens, and Kings have pictures of people on them, and thus are called face cards. What is the probability of selecting a red face card from a standard deck of playing cards?
- 6. (F) The following table lists the probability that some interesting event will occur.

Event	Probability
Appearing on The Tonight Show	1 in 490,000
Being a victim of a serious crime	5%
Writing a best-selling novel	0.00205
Congress will override a veto	4%
Earning a Ph.D.	0.008

Which of these events is most likely to occur?

Which event is least likely to occur?

Source: What Are the Chances?

Use the following bar graph, which shows the highest level of education received by employees of a company, to answer questions 7 - 10.



Find the probability that an employee chosen at random has

- 7. (F) a Ph.D.
- 8. (F) an Associate Degree
- 9. (F) a Master's Degree
- 10. (F) a Bachelor's Degree
- 11. (F) What is the probability that a number selected at random from the set {2, 3, 7, 12, 15, 22, 72, 108} will be divisible by both 2 and 3?
- 12. (S) You roll a pair of dice and record the sum.
 - a. List all the possible sums and determine the probability of rolling each sum.
 - b. Use a technology tool to simulate rolling a pair of dice and recording the sum 100 times. Make a tally of the 100 sums and use these results to list the probability of rolling each sum.
 - c. Compare the probabilities in part (a) with the probabilities in part (b). Explain the similarities and differences.

Odds: In gambling, the chances of winning are often written in terms of odds rather than probabilities. The **odds of winning** is the ratio of the number of successful outcomes to the number of unsuccessful outcomes. The **odds of losing** is the ratio of the number of unsuccessful outcomes to the number of successful outcomes. For example, if the number of successful outcomes is 2 and the number of unsuccessful outcomes is 3, the odds of winning are 2:3 (read "2 to 3") or $\frac{2}{3}$. (Note: The *probability* of success is $\frac{2}{5}$.)

- 13. (S) The odds of an event occurring are 4:5. Find (a) the probability that the event will occur and (b) the probability that the event will not occur.
- 14. (S) A card is picked at random from a standard deck. Find the *odds* that it is a spade.
- 15. (S) A beverage company puts game pieces under the caps of its drinks and claims that one in six game pieces wins a prize. The official rules of the contest state that the odds of winning a prize are 1:6. Is the claim "one in six game pieces wins a prize" correct? Why or why not?

CRS Skill: PSD 401

Review Skill: Calculate the average of a list of numbers.

Focus Skill: Calculate the missing data value given the average and all data values but one.

- Level 2: Basic, one-step computations; n < 4; All values are whole #'s
- Level 3: Multiple-step computations; Values might be non-integer
- Level 4: Application

Secondary Skill: Calculate the average given the frequency counts of all data values.

Questions:

- 1. Review: Find the mean of the numbers: 2, 8, 16, 18.
 - a. 10 (Averages first and last number only)
 - b. 11 (Correct answer)
 - c. 12 (Averages middle two numbers; median)
 - d. 44 (Sum of the 4 numbers)
 - e. There is no mean; all numbers occur only once.
- 2. Review: Find the mean of the numbers: -2, 0, 1, 3.6, 5.4.

- a. 1 (Median)
- b. 1.6 (Correct answer)
- c. 2 (Divides by 4 instead of 5)
- d. 2.4 (Ignores the negative sign)
- e. 3 (Combination of c and d)
- 3. (F2): The average of 4 numbers is 92. If 3 of the numbers are 80, 88, and 106, find the fourth #.
- 4. (F2): The average of 3 #'s is 90. If 2 of the numbers are each 100, find the 3rd number.
- 5. (F2): The average of 4 numbers is 5. Find the fourth number is the other three are -7, -3, and 10.
- 6. (F3): The average of 4 numbers is 10. Find all four numbers if the first number is 7 and the remaining 3 are: x, x 2, and 2x + 3.
- 7. (F3): The average of 4 numbers is 21.7. If one of the numbers is 11 and another is 36, find one possible set of numbers for the remaining pair. Explain why your pair of numbers is *not* the only possibility.
- 8. (F3): The average of 5 numbers is 11.1. If one of the numbers is 10, another is 22.1, and the remaining three numbers are all equal, what are each of the remaining three numbers?





- 10. (F4): Mr. K's five math classes averaged 82% on his final exam. If the first four classes averaged 77.1, 81.3, 87.5 and 94.1, what was the average score for the fifth class?
- 11. (F4): To meet expectations, a company must average \$2.2 million in sales for the year. If their sales by quarter were \$760,000; \$1,410,000; and \$3.9 million, what would the fourth quarter sales need to be to *exceed* expectations?

12. Secondary: The # of correct answers to a quiz is given in the chart below. What is the average number of correct answers for the class?

# Correct	0	1	2	3	4	5
# of Students	2	1	2	4	7	6

13. Secondary: A group gives out the following prizes in their raffle drawing. Each ticket sells for \$2. What is the average amount paid out per player?

Prize Won	\$0	\$1	\$10	\$100	\$1000
# of Winners	67	20	8	4	1

14. Secondary: Roll a die 25 times and fill in the table below listing the frequency of each result. Then, find the average value of the 25 rolls. Most people will get a value close to 3.5. Why do you think this is?

Value of Roll	1	2	3	4	5	6
# of						
Occurrences						

15. Secondary: Beth rolls a pair of dice and adds the two numbers shown. If she does this 20 times, what do you think the average sum would be? Perform the experiment and calculate the average sum of a pair of dice. A frequency table is provided for you to keep track of your results.

Sum						
# of						
Occurrences						