14.2 HW KEY: PAGES 502-503 #1-12

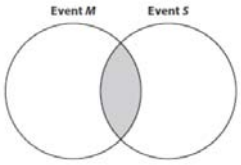
Monday, April 4, 2016
9:37 AM

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

Practice for Lesson 14.2

For Exercises 1–6, a card is randomly drawn from a deck of 15 cards numbered 1 through 15. Find the probability of the given event.

1. A 1 is drawn given that the number on the card is less than 10.
2. A 3 is drawn given that the number on the card is odd.
3. An odd number is drawn given that the number on the card has two digits.
4. An even number is drawn given that the number on the card is greater than 10.
5. A multiple of 5 is drawn given that the number on the card is between 4 and 13.
6. A 4 is drawn given that the number on the card is prime.
7. Venn diagrams can be used to help find conditional probabilities. In the Venn diagram below, the shaded area is the location of the results that are in both Event M and Event S.



   a. Draw the Venn diagram and use the following information to place numbers of students in each of the three regions of the diagram.
      Event M represents an A grade in mathematics.
      Event S represents an A in science.
      12 students received an A in math but not in science.
      10 students received an A in science but not in math.
      2 students received an A in math and science.
   b. What is the probability that a particular randomly chosen student received an A in math?
   c. What is the probability that a particular randomly chosen student received an A in math, given that the student received an A in science? Explain.
8. A number cube, labeled 1–6, is rolled and the result is a 3. If a second cube with the same labels is rolled, what is the probability that the sum of the two cubes is 7?
9. A diamond is drawn from a standard deck of 52 cards and placed face down on the table.
   a. How many diamonds remain in the deck?
   b. How many cards are left in the deck?
   c. What is the probability of drawing another diamond from the deck?
   d. Was the second draw affected by the first draw? Explain.
10. A weather forecaster said that the probability of rain tomorrow is 60%. What is the probability that it will not rain?
11. If the probability of a defective snap on a newly manufactured pair of jeans is 0.11, what is the probability that a snap is not defective?
12. The figure below shows a target. Assume that a dart is equally likely to hit any point on the target. Find the probability that a dart thrown at the target will land in the unshaded region.
    Use 3.14 for π.

① $P(\text{draw 1} \mid \text{less than 10}) = \frac{1}{9}$ ← # less than 10 (#1-9)

② $P(\text{draw 3} \mid \text{odd card}) = \frac{1}{8}$ ← odd

③ $P(\text{odd} \mid \text{2 digits}) = \frac{3}{6} = \frac{1}{2}$ → 11, 13, 15

④ $P(\text{even} \mid \text{\# greater than 10}) = \frac{2}{5}$ ← 12, 14

⑤ $P(\text{mult. of 5} \mid \text{card btwn. 4 \& 13}) = \frac{2}{10} = \frac{1}{5}$ ← 5, 10

⑥ $P(\text{Draw 4} \mid \text{card is prime}) =$ not possible! Since the card must be prime you cannot draw a 4!

⑦ A) "A" in Math: 12, 2; "A" in Science: 2, 10

B) $P(\text{A in Math}) = \frac{12+2}{24} = \frac{14}{24} = \boxed{\frac{7}{12}}$

C) $Pr(\text{A in Math} \mid \text{A in Science}) = \frac{2}{12} = \frac{1}{6}$

⑧ $P(\text{sum is 7} \mid \text{3 on first roll}) = \frac{1}{6}$

*Must be a 4!

⑨ A.) 12 remain

B.) 51 cards

C.) $Pr(\text{draw diamond} \mid \text{drew } \diamond \text{ on 1st time}) = \boxed{\frac{12}{51} = \frac{4}{17}}$

D.) Yes! Without replacing the diamond card, there is one less card in the deck and one less diamond in the deck.

⑩ $P(\text{no rain}) = 1 - P(\text{rain})$

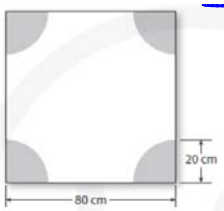
$= 1 - .6$

$= \boxed{.4 \text{ or } 40\%}$

⑪ $P(\text{not defective}) = 1 - P(\text{defective})$

$= 1 - 0.11$

$= \boxed{0.89 \text{ or } 89\%}$



$= 0.89$ or 89%

(12) $P(\text{unshaded}) = 1 - P(\text{shaded})$ ← $\frac{P(4\text{ shaded})}{P(\square)}$

$= 1 - \frac{400\pi}{80 \cdot 80}$

$= 1 - \frac{400\pi}{6400}$

$= 1 - \frac{\pi}{16}$

$= \frac{16}{16} - \frac{\pi}{16}$

$= \frac{16-\pi}{16}$ or 80.37%

$\text{Area}_{\text{shaded}} = \frac{1}{4}(\pi(20)^2)$

$= \frac{1}{4}(400\pi)$

$= 100\pi$

Since there are 4 shaded multiply $100\pi(4) = 400\pi$.

(or you could have done this at the beginning :))