Honors Math II
Unit 10 day 3

Name Key
Period 1 Date

Choosing Numbers: You have an equally likely chance of choosing any integer from 1 to 50. Find the probability of the given event.

1. An even number is chosen
$\frac{1}{2}$

2. A number less than 35 is chosen
$\frac{34}{50}$

3. A perfect square number
1, 4, 9, 16, 25, 36, 49 $\frac{7}{50}$

4. A prime number is chosen
2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47
$\frac{15}{50} = \frac{3}{10}$

5. A factor of 150 is chosen
1·150, 2·75, 3·50, 5·30, 6·25, 10·15 $\frac{10}{50} = \frac{1}{5}$

6. A multiple of 4 is chosen
4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48 $\frac{12}{50} = \frac{6}{25}$

7. A two-digit number is chosen
$\frac{41}{50}$

8. A perfect cube is chosen
1, 8, 27 $\frac{3}{50}$

Choosing Cards: A card is randomly drawn from a standard deck of 52 cards. Find the probability of drawing the given card.

9. The king of diamonds $\frac{1}{52}$

10. A king $\frac{4}{52} = \frac{1}{13}$

11. A spade $\frac{13}{52} = \frac{1}{4}$

12. A black card $\frac{1}{2}$

13. A card other than a 2 $\frac{48}{52} = \frac{12}{13}$

14. A face card (a king, queen, jack)
$\frac{12}{52} = \frac{3}{13}$

Rolling a die: The results of rolling a six-sided die 150 times are shown. Use the table to find the experimental probability of the given event. Compare your answer to the theoretical probability of the event.

Roll						
Number of occurences	27	22	18	26	27	30

15. Rolling a 5 $\frac{27}{150}$

16. Rolling an even number
22 + 26 + 30 $\frac{78}{150}$

17. Rolling a number less than 5
27 + 22 + 18 + 26 $\frac{93}{150}$

18. Rolling any number but a 3
27 + 22 + 26 + 27 + 30 $\frac{132}{150}$

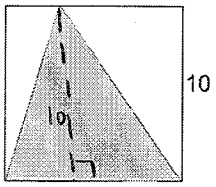
19. You flip a coin 80 times. You get heads 37 times and tails 43 times. What is the experimental probability of getting heads?

A) 0.4625 B) 0.5 C) 0.5375 D) 0.8605

$\frac{37}{80} = .4625$

Find the probability that a dart thrown at the given target will hit the shaded region. Assume the dart is equally likely to hit any point inside the target.

20.

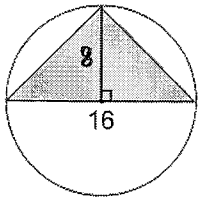


$A_\triangle = \frac{1}{2}(10)(10) = 50$

$A_\square = 100$

$\frac{50}{100} = \frac{1}{2} = .5$

21.

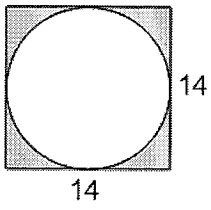


$A_\circ = \pi(8)^2 = 64\pi$

$A_\triangle = \frac{1}{2}(16)(8) = 64$

$\frac{64}{64\pi} = \frac{1}{\pi} = .3183$

22.

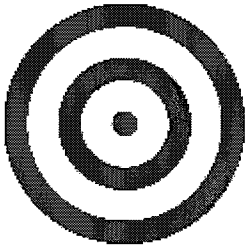


$A_\circ = \pi(7)^2 = 49\pi$

$A_\square = 196$

$\frac{196 - 49\pi}{196} = .2146$

23. The standard archery target used in competition has a diameter of 80 centimeters. Find the probability that an arrow shot at the target will hit the center circle, which has a diameter of 16 centimeters. Assume the arrow is equally likely to hit any point inside the target.



$A_{center} = \pi(8)^2 = 64\pi$

$A_{target} = \pi(40)^2 = 1600\pi$

$\frac{64\pi}{1600\pi} = .04$

24. A coin is tossed 100 times. It falls heads 47 times. What is the experimental probability that it falls:

A) heads $\frac{47}{100} = .47$

B) tails? $\frac{53}{100} = .53$

25. A die is rolled 300 times and the results are:

Result	1	2	3	4	5	6
Frequency	52	47	50	51	49	51

What is the experimental probability of rolling:

A) a 6 $\frac{51}{300} = .17$

B) a 2 $\frac{47}{300} = .157$

C) a 6 or a 2 $\frac{98}{300} = .3267$

26. A pair of coins is tossed 500 times and the results are:

Result	two heads	a head and a tail	two tails
Frequency	121	251	128

What is the experimental probability of tossing:

A) two heads $\frac{121}{500} = .242$

B) a head and a tail $\frac{251}{500} = .502$

C) at least two tails

128

$\frac{128}{500} = .256$

27. A fair die is rolled. Determine the probability of getting:

A) a 3 or 5 $\frac{1}{6}+\frac{1}{6}=\frac{2}{6}=\frac{1}{3}$

B) a negative integer 0

C) a 9 0

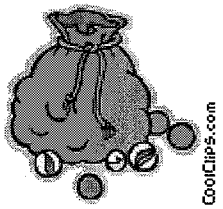
D) a result less than 4 $\frac{1}{2}$

E) a non-five $\frac{5}{6}$

28. A bag contains 4 red and 3 green marbles. One marble is randomly selected from the bag. Determine the probability of getting:

A) a red $\frac{4}{7}$

B) a green $\frac{3}{7}$



C) a red or a green $\frac{4}{7}+\frac{3}{7}=\frac{7}{7}=1$

D) a red and a green 0

29. A 52 card deck is well shuffled, and then one card is dealt from the top of the deck. Determine the probability that it is:

A) a Jack $\frac{4}{52}=\frac{1}{13}$

B) a non-Jack $\frac{48}{52}$

C) a black card $\frac{1}{2}$

D) a diamond and an ace $\frac{1}{52}$

E) a diamond or an ace $\frac{13}{}$ $\frac{3}{}$ $\frac{16}{52}$

F) a diamond $\frac{1}{4}$

30. A lottery consists of 80 tickets number 1 to 80. One ticket is chosen at random. Determine the probability that the ticket is:

A) a single digit number $\frac{9}{80}$

B) a multiple of 8
8, 16, 24, 32, 40, 48, 56, 64, 72, 80
$10/80 = 1/8$

C) a multiple of 5 or 8
5, 10, 15, 20, 25, 30, 35, 40
45, 50, 55, 60, 65, 70, 75, 80
$\frac{24}{80}$

D) a factor of 36
1·36 6·6
2·18
3·12
4·9
$\frac{9}{80}$

31. Determine the probability that a person randomly selected in the street has his or her birthday in

A) May $\frac{1}{12}$

B) February $\frac{1}{12}$

Use the following functions to answer questions 1 – 10.

$f(x) = (x-1)^2 + 2$, $h(x) = 2x - 4$, $g(x) = \sqrt{x} - 1$, $j(x) = 3x + 5$

stretch 2 vertical + 4 left 4 down 3

1. $2f(x+4) - 3$

$2f(x+4) - 3 = 2(x+3)^2 - 1$

2. $f^{-1}(x)$, *given that* $f(x)$ *is restricted to* $x \geq 1$

$x = (y-1)^2 + 2$

$x - 2 = (y-1)^2$

$y - 1 = \pm\sqrt{x-2}$

$y = \pm\sqrt{x-2} + 1$

$y = \sqrt{x-2} + 1$

3. $(g \circ f)x$

$g(f(x)) =$

$\sqrt{(x-1)^2 + 2} - 1$

4. $3h(x-2) + 6$

$3(2(x-2) - 4) + 6$

$3(2x - 4 - 4) + 6$

$3(2x - 8) + 6$

$6x - 24 + 6$

$6x - 18$

5. $g(x-2) - 4$

$\sqrt{x-2} - 1 - 4$

$\sqrt{x-2} - 5$

6. $h^{-1}(x)$

$x = 2y - 4$

$x + 4 = 2y$

$y = \frac{1}{2}x + 2$

$h^{-1}(x) = \frac{1}{2}x + 2$

7. $h(x) + j(x)$

$(2x - 4) + (3x + 5)$

$5x + 1$

8. $(h \cdot j)x$

$(2x - 4)(3x + 5)$

$6x^2 + 10x - 12x - 20$

$6x^2 - 2x - 20$

9. $3f(2) + g(9)$

$3(3) + 2$

$9 + 2$

11

10. $j(m^2)$

$3m^2 + 5$