*AAT

Chapter 10: Review for Test, omit 10.4 (IC/HW)

Name: Key

Date: ______ Period: ______

1. Find the 8th term of the sequence.

$\left\{6 + \frac{1}{n}\right\}$

$a_8 = 6 + \frac{1}{8} = \frac{48}{8} + \frac{1}{8} = \frac{49}{8} = 6\frac{1}{8}$

2. Find the third term of the recursively defined infinite sequence.

$a_1 = 3$, $a_{k+1} = 4a_k - 5$

$a_1 = 3$

$a_2 = 4(3) - 5 = 7$

$a_3 = 4(7) - 5 = 23$

3. Find the third term of the recursively defined infinite sequence.

$a_1 = 3$, $a_{k+1} = (a_k)^{k+1}$

$a_1 = 3$

$a_2 = 3^{1+1} = 3^2 = 9$

$a_3 = 9^{2+1} = 9^3 = 729$

4. Find the sum.

$\sum_{k=1}^{10} (2 + (-1)^k)$

$a_1 = 1$

$a_{10} = 3$

$S_n = \frac{n}{2}(a_1 + a_n)$

$= \frac{10}{2}(1 + 3)$

$= 5(4)$

$S_n = 20$

5. Find the fifth term, the tenth term, and the nth term of the arithmetic sequence.

-5, -4.5, -4, -3.5, ...

$d = -4.5 - (-5) = .5$

$a_5 = -3.5 + .5 = -3$

$a_{10} = a_1 + (n-1)d$

$= -5 + 9(.5)$

$= -.5$

$a_n = a_1 + (n-1)d$

$= -5 + (n-1).5$

$= -5 + .5n - .5$

$a_n = -5.5 + .5n$

6. Insert two geometric means between 6 and 384.

$6, \underline{\quad 24 \quad}, \underline{\quad 96 \quad}, 384$

$a_n = a_1 r^{n-1}$

$\frac{384}{6} = \frac{6r^3}{6}$ $\qquad r^3 = 64; \ r = 4$

7. A rubber ball is dropped from a height of 55 feet. If it rebounds approximately two-thirds the distance after each fall, use an infinite geometric series to approximate the total distance the ball travels.

$r = \frac{2}{3} \qquad S = \frac{a_1}{1-r}$

$S = 55 + 2\left[\frac{55\left(\frac{2}{3}\right)}{1-\frac{2}{3}}\right]$

$= 55 + 2(110) = 275$

8. Expand and simplify.

$(3x - y)^3$ $\qquad (3x)^3 + \binom{3}{1}(3x)^2(-y) + \binom{3}{2}(3x)^1(-y)^2 + \binom{3}{3}(3x)^0(-y)^3$

$27x^3 - 27x^2y + 9xy^2 - y^3$

9. Suppose five cards are drawn from a deck. Find the probability of obtaining a flush (five cards of the same suit). * Pick 5 of the 13 cards in one suit ... there are 4 suits!

$\frac{C(13,5) \cdot 4}{C(52,5)} = \frac{5148}{2{,}598{,}960} = .00198$ - or - $1 \cdot \frac{12}{51} \cdot \frac{11}{50} \cdot \frac{10}{49} \cdot \frac{9}{48} = .001981$

10. Find the sum of the arithmetic sequence S_n that satisfies the stated conditions.

$a_1 = 30, d = -2, n = 28$ $\qquad S_n = \frac{n}{2}\left[2a_1 + (n-1)d\right]$

$= \frac{28}{2}\left[2(30) + (28-1)(-2)\right]$

$S_n = 84$

11. Find the sum.

$\sum_{k=1}^{28} \frac{1}{2}k + 6$

$a_1 = 6.5$

$a_2 = 7$

$a_3 = 7.5$

$S_n = \frac{28}{2}\left(2(6.5) + (28-1)(.5)\right)$

$S_n = 371$

12. Find the number.

C(d, d-1)

$$\frac{d!}{(d-(d-1))!\,(d-1)!} = \frac{d!}{1!\,(d-1)!} = \frac{d\cdot\cancel{(d-1)!}}{\cancel{(d-1)!}} = d$$

13. Find the number.

C(7, 7)

$$\frac{7!}{(7-7)!\,7!} = \frac{7!}{0!\,7!} = \frac{\cancel{7!}}{1\cdot\cancel{7!}} = 1$$

14. A single die is tossed. Find the odds that the die is an even number.

$$P(E) = \frac{N(E)}{N(S)} = \frac{3}{6}$$

$$O(E) = 3 \text{ to } 3 \text{ or } 1 \text{ to } 1$$

$$N(E) \text{ to } N(E)'$$

15. Two dice are tossed. Find the odds that the sum is 8. (2,6), (3,5), (4,4), (6,2), (5,3)

$$P(8) = \frac{5}{36} = \frac{N(E)}{N(S)}$$

$$O(E) = N(E) \text{ to } N(E)'$$

5 to 31