$y = ab^x$

Name Key

Review for Test 12 Algebra 2 and Trig

1. Write the first three terms of the sequence:

$a_n = n^2 - 1$

$1^2 - 1 = 0$

$2^2 - 1 = 3$

$3^2 - 1 = 8$ $\{0, 3, 8\}$

2. Find the 12th term of the sequence

$a_n = n(n+2)$

$= 12(12+2)$

$= 12(14) = 168$

3. Find the 15th term of the sequence

$a_n = (-1)^{n-1} n^2$

$(-1)^{15-1} 15^2$

225

4. Find S_5 for the sequence:

$a_n = (-1)^n 2^n$

$a_1 = (-1)^1 2^1 = -2$

$r = -2$

$S_5 = \frac{a_1(1-r^5)}{1-r} = \frac{-2(1-(-2)^5}{1-(-2)} = \frac{-2(33)}{3} = -22$

5. Evaluate: $\sum_{j=1}^{3} (2j-1)$

$2(1)-1 = 1$

$2(2)-1 = 3$

$2(3)-1 = 5$

$\Sigma\ 9$

6. Use sigma notation to represent

$-3 + 6 - 12 + 24 - 48 + \ldots$

for 35 terms.

Choose:

- $\sum_{n=1}^{35} (-1)^n \cdot 3n$
- ○ $\sum_{n=1}^{35} (-1)^n \cdot 3 \cdot 2^{n-1}$
- ● $\sum_{n=1}^{35} (-1)^{n+1} \cdot 3 \cdot 2^{n-1}$
- ○

7. $8 \sum_{k=3}^{6} \frac{1}{2} k$

$8 \cdot 9 = 72$

$\frac{1}{2}3 = \frac{3}{2}$

$\frac{1}{2}4 = \frac{4}{2}$

$\frac{1}{2}5 = \frac{5}{2}$

$\frac{1}{2}6 = \frac{6}{2}$ $\Sigma = \frac{18}{2}$

8. Find the sum of the first 20 terms of the sequence 4, 6, 8, 10, ...

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

$a_1 = 4$

$n = 20$

$d = 2$

1st find a_n

$4 + 2(20-1) = 4 + 2(19) = 42$

$Sum_5 = \frac{20(4+42)}{2} = 460$

9. Find the sum of the sequence

$-8, -5, -2, \ldots, 7$

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

$7 = -8 + 3(n-1)$

$7 = -8 + 3n - 3$

$18 = 3n$ $n = 6$

$-3 = \frac{6(-8+7)}{2}$

10. Find the 9th term of the sequence

$1, \sqrt{2}, 2, \ldots$

Common ratio $= \sqrt{2}$

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

$a_9 = (1)\sqrt{2}^{9-1}$

$= 16$

11. Evaluate this series using a formula:

$\sum_{k=1}^{14} (1 - 2k)$

$S_{14} = \frac{14(-1 + -27)}{2} = 7(-28)$

$a_1 = 1 - 2(1) = -1$

$a_{14} = 1 - 2(14) = -27$

-196

12. Insert three geometric means between 1 and 81.

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

$81 = 1(r^{5-1})$

$81 = r^4$

$r = 3$

1, 3, 9, 27, 81

13. Find t_{12} for a geometric sequence where $t_1 = 2 + 2i$ and $r = 3$

$(2+2i)3^{(12-1)}$

$(2+2i)\,177147$

$= 354294 + 354294i$

14. Find the indicated sum

$\sum_{k=1}^{n} 4(0.5)^k$

$S_n = \frac{a_1(1-r^n)}{1-r}$

$\frac{2(1-(.5)^n)}{1-.5} = \frac{2-2(.5)^n}{.5}$

$4 - (.5)^{n-1}$