Name: _____ Key

Pre-Calculus
REVIEW: 10.1 – 10.2

For numbers 1 – 3, write the first three terms of each sequence whose general rule is given.

1. $a_n = 3n + 2$

5 8 11

2. $a_n = 3^n$

3, 9, 27

3. $a_n = (-3)^n$

-3, 9, -27

For numbers 4 – 5, find each indicated sum.

4. $\sum_{n=1}^{6} 5n$

1 2 3 4 5 6
5 + 10 + 15 + 20 + 25 + 30

=

5. $\sum_{n=5}^{9} 2n^2 - n$

5 6 7 8 9
$[2(5)^2-(5)] + [2(6)^2-(6)] + [2(7)^2-(7)] + [2(8)^2-(8)] + [2(9)^2-(9)] =$ 475

45 + 66 + 91 + 120 + 153

For numbers 6 – 8, express each sum using summation notation. Use 1 as the lower limit of summation and n for the index of summation.

6. $1 + 4 + 7 + 10 + 13, \ldots$

$a_n = 1 + (n-1)(3)$

$a_n = 3n - 2$

$\sum_{n=1}^{\infty} 3n - 2$

7. $2 + 4 + 6 + 8 + \ldots + 30$

$a_n = 2n$

$\sum_{n=1}^{15} 2n$

8. $\frac{1}{4} + \frac{1}{2} + \frac{3}{4} + 1 + \frac{5}{4}$

$a_n = \frac{1}{4} + (n-1)(\frac{1}{4})$

$a_n = \frac{1}{4}n$

$\sum_{n=1}^{5} \frac{1}{4}n$

For numbers 9 – 11, write the rule for the nth term.

9. $a_1 = 200, d = 20$

$a_n = 200 + (n-1)(20)$

$a_n = 20n + 180$

10. $a_4 = 26, d = -2$

$a_1 = 32$
$a_2 = 30$
$a_3 = 28$
$a_4 = 26$

So $a_1 =$

$a_n = 32 + (n-1)(-2)$

$a_n = -2n + 34$

11. $a_2 = -15, a_4 = -23$

$a_2 = a_1 + (2-1)d$ | $a_4 = a_1 + (4-1)d$

$-15 = a_1 + d$ | $-23 = a_1 + 3d$

solve

$a_1 = -11$ $d = -4$

$a_n = -4n - 7$

OR

$\frac{-23 + 15}{4 - 2} = \frac{-8}{2} = -4 = d$

Go from there.

For numbers 12 – 14, find the indicated term of the arithmetic sequence.

12. Find a_{50} when $a_1 = 7$, $d = 5$.

$a_{50} = 7 + (50-1)(5)$

$a_{50} = 252$

13. $a_1 = 2$, $a_2 = 22$, $a_{200} = ?$

$a_{200} = 2 + (200-1)(20)$

$a_{200} = 3982$

14. $a_9 = -38$, $a_{74} = -363$, $a_1 = ?$

$-38 = a_1 + 8d$ and $-363 = a_1 + 73d$

$+\ 38 = -a_1 - 8d$

$d = -5$ so $a_1 = 2$

15. Which term in the sequence 2, –3, …, –813 is –813?

$-813 = 2 + (n-1)(-5)$ $n = 164$

$-813 = 2 - 5n + 5$

16. Find the sum of the first 20 terms of the arithmetic sequence: 4, 10, 16, 22, …

$S_{20} = \frac{20}{2}(4 + 118)$

$S_{20} = 1220$

$a_{20} = 4 + (20-1)(6)$

$a_{20} = 118$

17. Find n for the given sum $S_n = 2272$ of the arithmetic series: 9 + 13 + 17 + 21 + 25 + …

$2272 = \frac{n}{2}(9 + a_n)$

$4544 = n(9 + [4n+5])$

$0 = 4n^2 + 14n - 4544$

$a_n = 9 + (n-1)(4)$

$a_n = 4n + 5$

$n = \frac{-(14) \pm \sqrt{(14)^2 - 4(4)(-4544)}}{2(4)}$

$n = 33$ and ~~$-35\frac{5}{8}$~~

OR Graph it!

18. Kathryn started saving quarters in a jar. She began by putting two quarters in the jar the first day and then she put one additional quarter in the jar each successive day.

$a_1 = 2$ $d = 1$

a) Use sigma notation to represent the total number of quarters Kathryn has after 10 days.

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

$\sum_{n=1}^{10} n+1$

b) Find the sum represented in part a.

$S_{10} = \frac{10}{2}(2 + 11) = 65$

c) \$16.25

19. In a charity golf tournament, each of the top ten finishers wins a donation to the charity of his or her choice. The amount of donation follows the arithmetic sequence shown in the picture below. What is the total amount of money donated to charity as a result of the tournament?

$a_1 = 2500$

$d = -250$

$a_n = 2500 + (n-1)(-250)$

$a_n = -250n + 2750$

$S_{10} = \frac{10}{2}(2500 + 250)$

\$ 13,750

$0 = -250n + 2750$

$n = 11$ 11th place donates \$0