Algebra II Unit 11 Review v.06

1. An arithmetic sequence has $a_4 = 12$ and $a_{12} = 35$. Write the equation.
2. Write the next 3 terms and give the rule for each:
   a) 3, 8, 13, … b) 99, 33, 11, …

3. Write a rule for each:
   a) $a_1 = 10$, $d = 3$ b) $a_1=5$, $r = 2$ c) geometric with $a_3 = 15$ and $a_9 = 960$

4. Solve each: a) $4x^2 - 3x + 1 = 0$ b) $2(5)^x = 9^x$ c) $4x = 9^x$
5. Graph and write the equation of a circle with radius 5 and center at (-3, 5).
6. Graph each: a) $\frac{x^2}{4} - \frac{(y-1)^2}{9} = 1$ b) $\frac{(x+2)^2}{81} + \frac{(y-1)^2}{16} = 1$
7. Find the sum of the first 80 numbers.
8. Solve each: a) $\sum_{n=0}^{12} 3n - 4$ b) $\sum_{n=1}^{\infty} 3(\frac{1}{5})^{n-1}$ c) $\sum_{n=1}^{7} 2(3)^{n-1}$
   d) $\sum_{n=1}^{30} (2n-1)$ e) $\sum_{n=1}^{10} (3-4n)$
9. Write a recursive rule for: 2, 8, 32, 128
10. Write the first 5 terms for: $a_n = a_{n-1} + 7n$ where $a_1 = 7$
11. The amount of bacteria in a culture sample triples each day. If there were 2 mg on the first day, how much would there be on the 20th day? After how many days will there be 4,000 mg?

Answers:
1. $a_n = .5 + 2.875n$
2. a) 18, 23, 28 $a_n = -2 + 5n$ b) 11/3, 11/9, 11/ 27 $a_n = 99(1/3)^{n-1}$
3. a) $a_n = 7 + 3n$ b) $a_n = 5(2)^{n-1}$ c) $a_n = (15/4)(2)^{n-1}$
4. a) $.375 \pm .3307i$ b) $x = 1.179$ c) no solution (if you graph it, it never intersects)
5.
6. review from chapter 10 on how to graph these (you do not need to find foci)
7. $S = 3240$ ➔ $1 + 2 + 3 + \ldots + 80$ $a_1 = 1$, $d = 1$, $a_n = 80$ use formula $S_n = n\left(\frac{a_1 + a_n}{2}\right)$
8. a) $S = 182$, arithmetic with $a_1 = -4$, $a_n = 3(12)-4 = 32$
   b) $S = 15/4$, infinite geo with $a_1 = 3$ and $r = 1/5$
   c) $S = 2186$, finite geo with $a_1 = 1$, $n=7$ and $r = 2$

9. $a_n = 4\, a_{n-1}$ where $a_1 = 2$
10. 7, 21, 42, 70, 105
11. 2324522934 mg, 7.92, so 8 days ➔ geometric with $a_1 = 2$ and $r = 3$ $a_n = 2(3)^{n-1}$