Arithmetic Sequence
Homework 1

Name_____
Teacher_____ Period_____

Determine if the sequence is arithmetic. If it is, find the common difference.

1. 35, 32, 29, 26, ...
arithmetic $d = -3$

2. -3, -23, -43, -63, ...
arithmetic $d = -20$

Given the explicit formula, find the next four terms and the indicated term.

3. $a_n = -11 + 7n; find\ a_{24}$

$a_1 = -4$
$a_2 = 3$
$a_3 = 10$
$a_4 = 17$

$a_{24} = -11 + 7(24)$
$a_{24} = -11 + 168$
$a_{24} = 157$

4. $a_n = 65 - 100n; find\ a_{39}$

$a_1 = -35$
$a_2 = -135$
$a_3 = -235$
$a_4 = -335$

$a_{39} = 65 - 100(39)$
$a_{39} = 65 - 3900 = -3835$

Write the recursive and explicit formulas for the arithmetic sequences. Simplify the explicit formula.

5. $a_1 = 28, d = 10$

$a_1 = 28$
$a_n = a_{n-1} + 10$

$a_n = 28 + (n-1)(10)$
$a_n = 28 + 10n - 10$
$a_n = 10n + 18$

6. $a_{37} = 249, d = 8$

$a_1 = -39$
$a_n = a_{n-1} + 8$

$249 = a_1 + (37-1)(8)$
$249 = a_1 + (36)(8)$
$249 = a_1 + 288$
$-39 = a_1$

$a_n = -39 + (n-1)(8)$
$a_n = -39 + 8n - 8$
$a_n = 8n - 47$

Write the explicit formula and the first five terms.

7. $a_1 = \frac{3}{5}, d = -\frac{1}{3}$

$\frac{3}{5}, \frac{4}{15}, \frac{-1}{15}, \frac{-2}{5}, \frac{-11}{15}$

$\frac{6}{15} = \frac{-2}{5}$

$a_n = \frac{3}{5} + (n-1)(-\frac{1}{3})$
$a_n = \frac{3}{5} + -\frac{1}{3}n + \frac{1}{3}$
$a_n = \frac{9}{15} + -\frac{1}{3}n + \frac{5}{15}$
$a_n = -\frac{1}{3}n + \frac{14}{15}$
$a_n = -\frac{5}{15}n + \frac{14}{15}$

8. $a_{40} = -1191, d = -30$

$-1191 = a_1 + (40-1)(-30)$
$-1191 = a_1 + 39(-30)$
$-1191 = a_1 - 1170$
$-21 = a_1$

$a_n = -21 + (n-1)(-30)$
$a_n = -21 + -30n + 30$
$a_n = -30n + 9$

$-21, -51, -81, -111, -141$

Solve using your knowledge of arithmetic sequences.

9. You have $243 in your savings account. You put $5 each week into this account. How much money is in the account after 36 weeks? How much is the account after a year? Ignore the interest.

$243 + 5(36) = 243 + 180 = \$423$

10. There are 200 seats in the last row of an auditorium and 20 seats in the first row. Each row has two more seats than the previous row. How many rows are in the auditorium?

$200 = 20 + (n-1)(2)$
$180 = 2n - 2$
$182 = 2n$
$91 = n$

91 rows

11. At 1:00 pm 15 people are outside of Best Buy to buy the new i-phone. By 7:00 pm there are 500 people waiting. What is the average number of people who joined the group each hour?

$500 = 15 + 6d$
$485 = 6d$
$81 \approx d$

$485 - 15 = 485$

$6\overline{)485}$ $80\ 5/6$
48

About 81 people per hour