Homework 9-2: Complete your assignment on a separate sheet of paper. Show all work.

Write an explicit formula and find the tenth term of the sequence.

a. 2, 8, 14, 20,… b. 15, 23, 31,…

Find the missing term of the sequence.

a. 4,___, 22,… b. …, 25,____, 53,…

Give an example of a sequence that is not an arithmetic sequence.

9-2 #4 and 9-3 #4 are switched (by mistake) in the answers!

4. A student claims that the next term of the arithmetic sequence 0, 2, 4, … is 8. Explain and correct the student's error.
5. Explain the difference between an explicit formula and a recursive definition. Give an example of each.
6. A student claims that $a_n = 3n + 1$ is an explicit formula for the sequence 1, 4, 7, 10,… Is the student correct? If not, correct the student's error and write a correct explicit formula for the sequence.

Homework 9-3: Complete your assignment on a separate sheet of paper. Show all work.

1. Determine whether each sequence is geometric. If so, find the common ratio, write an explicit formula and find the eighth term.

a. 5, 10, 15,… b. 10, 20, 40,… c. 1, -3, 9,… d. 1, 4, 9,…

2. Find the missing term in the geometric sequence.

a. 4, ___, 16,… b. 2, ___, 50,…

3. Find the missing terms in the sequence 972, ___ , ___, ___, 12,…
4. Explain how you can determine whether a sequence is geometric or arithmetic.

Homework 9-4: Complete your assignment on a separate sheet of paper. Show all work.

1. Find the sum of each finite arithmetic series.

a. $4 + 7 + 10 + 13 + 16 + 19 + 22$

b. $10 + 20 + 30 + \ldots + 110 + 120$

2. Write each arithmetic series in summation notation.

a. $3 + 6 + 9 + 12 + 15 + 18 + 21$

b. $1 + 5 + 9 + \ldots + 41 + 45$

3. What is the difference between an arithmetic sequence and an arithmetic series?
4. Is it possible to have more than one arithmetic series with four terms whose sum is 44? Explain.
5. A student writes the arithmetic series $3 + 8 + 13 + \ldots + 43$ in summation notation as $\sum_{n=3}^{8}(3 + 5n)$. Describe and correct the error.

Homework 9-5: Complete your assignment on a separate sheet of paper. Show all work.

1. Evaluate each finite geometric series.

a. $\frac{1}{5} + \frac{1}{10} + \frac{1}{20} + \frac{1}{40} + \frac{1}{80}$ b. $9 - 6 + 4 - \frac{8}{3} + \frac{16}{9}$

2. Find the sum of each finite arithmetic series.

a. $4 + 7 + 10 + 13 + 16 + 19 + 22$ b. $10 + 20 + 30 + \ldots + 110 + 120$

HOMEWORK 9-2

1) a) $2, 8, 14, 20 \ldots$ (+6, +6, +6)

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

$a_n = 2 + (n-1)\cdot 6$

$a_n = 2 + 6n - 6$

$\boxed{a_n = 6n - 4}$

Explicit formula (simplified)

10^{th} term?

$a_{10} = 6 \cdot 10 - 4$

$a_{10} = 60 - 4$

$\boxed{a_{10} = 56}$

b) $15, 23, 31 \ldots$ (+8, +8)

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

$a_n = 15 + (n-1)\cdot 8$

$a_n = 15 + 8n - 8$

$\boxed{a_n = 8n + 7}$

Explicit formula (simplified)

10^{th} term?

$a_{10} = 8 \cdot 10 + 7$

$a_{10} = 80 + 7$

$\boxed{a_{10} = 87}$

2) a) $4, \underline{\quad ?\quad}, 13, \underline{\quad ?\quad}, 22$ (+d, +d)

$4 + 2d = 22 - 4$

$2d = 18$

$d = 9$

OR

$\frac{4+22}{2}$

$\frac{26}{2} = \boxed{13}$

b) $25, \underline{\quad ?\quad}, 39, \underline{\quad ?\quad}, 53$ (+d, +d)

$25 + 2d = 53$

$2d = 28$

$\boxed{d = 14}$

3) 1, 3, 6, 10, 15, ...

+2 +3 +4 +5 not arithmetic!

differences are not all the same!!!

4) arithmetic - if differences are constant
(subtract from right to left to find differences)

#4 (a-b)

geometric - if ratios are constant
(divide from right to left to find

5) explicit

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

helps us find ANY term of a sequence

recursive

$a_n = a_{n-1} + d$

helps us find only the NEXT term of a sequence

6) 1, 4, 7, 10

+3 +3 +3

~~$a_n = 3n + 1$~~ wrong!

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

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

$a_n = 1 + 3n - 3$

$\boxed{a_n = 3n - 2}$ correct

9-3 HOMEWORK

1) a) 5, 10, 15

$\frac{10}{5} = 2$

$\frac{15}{10} = 1.5$ (ratios not same)

not geometric

b) 10, 20, 40

$\frac{40}{20} = 2$

$\frac{20}{10} = 2$

Yes geometric!

$r = 2$

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

$a_n = 10 \cdot 2^{n-1}$

explicit formula

$a_8 = 10 \cdot 2^7$

$a_8 = 1280$

c) 1, -3, 9 ...

$\frac{9}{-3} = -3$

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

$r = -3$

yes, geometric

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

$a_n = 1 \cdot (-3)^{n-1}$

explicit formula $a_n = (-3)^{n-1}$

$a_8 = (-3)^7$

$a_8 = 2187$

d) 1, 4, 9

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

$\frac{9}{4} = 2\frac{1}{4}$

not geometric!

2) a) $4, \underline{8}, 16$ (·r, ·r)

$4 \cdot r^2 = 16$

$r^2 = 4$

$\boxed{r = 2}$

$4 \cdot 2 = 8$

b) $2, \underline{10}, 50$ (·r, ·r)

$2r^2 = 50$

$r^2 = 25$

$\boxed{r = 5}$

$2 \cdot 5 = 10$

3) $972, \underline{324}, \underline{108}, \underline{36}, 12 \ldots$ (·r, ·r, ·r, ·r)

$\frac{972}{972} \cdot r^4 = \frac{12}{972}$

$r^4 = \frac{12}{972}$

$r = \sqrt[4]{\frac{12}{972}}$

$\boxed{r = \frac{1}{3}}$

$972 \cdot \frac{1}{3} = 324$

$324 \cdot \frac{1}{3} = 108$

$108 \cdot \frac{1}{3} = 36$

4) $0, 2, 4, 6$ (+2, +2, +2)

#4

9-2

arithmetic sequence

Next term 8?

NO, Next term is 6!

because arithmetic means addition or subtraction