

Algebra 2
9.2-9.5 Partner Test

Name _____
Date _____ Hour _____

For exercises 1-2, write the first four terms of each sequence. Classify each formula as an explicit or recursive formula.

1. $a_1 = -2, a_n = a_{n-1} + 7$

1. _____
Explicit Recursive

2. $a_n = 5 + (n-1)(-3)$

2. _____
Explicit Recursive

For exercises 3 - 5, Is it a sequences or series, finite or infinite, arithmetic or geometric or neither?

3. $1 + 5 + 9 + \dots + 33$

4. $18, -6, 2, -2/3 \dots$

5. $1, 3, 6, 10, \dots$

sequence or series
finite or infinite
arith. or geo. or neither

sequence or series
finite or infinite
arith. or geo. or neither

sequence or series
finite or infinite
arith. or geo. or neither

6. For the arithmetic sequence in which $a_4 = 5$ and $a_{10} = 17$, find a_{50}

6. _____

7. Find the arithmetic mean between 5 and 21 .

7. _____

8. Find the geometric mean between 10 and 40.

8. _____

For exercises 9-10, write an explicit formula and recursive formula for each sequence.

9. 97, 86, 75, 64...

9. _____
Explicit formula

Recursive formula

10. 4, 12, 36, 108...

10. _____
Explicit formula

Recursive formula

11. Find a_{14} in the geometric sequence in which
 $a_4 = 24$ and $a_7 = 192$

11. _____

Write the series in Summation Notation and find the Sum.

12. $25 + 32 + 39 + \dots + 228$

12. _____
Summation Notation

Sum

Find the sum of the indicated series.

13. $3 + 6 + 12 + 24 + \dots$ for 20 terms

13. _____

Find the sum of the indicated series.

14. $\sum_{n=5}^{50} (4n - 10)$

14. _____

15. $\sum_{n=1}^{10} (4) \left(\frac{1}{2}\right)^{n-1}$

15. _____

16. $\sum_{n=1}^{\infty} (2) \left(\frac{1}{6}\right)^{n-1}$

16. _____

Does the series converge or diverge. If possible, find the sum.

17. $-15 + 30 - 60 + 120 - 240 \dots$

17. _____
converge or diverge

18. $12 + 6 + 3 + \frac{3}{2} + \dots$

18. _____
converge or diverge

19. A football stadium seats 30 people in the first row, 34 in the second row, 38 in the third row and so on. There are 50 rows in the theater.

a.) How many seats are in the 50th row?

19a. _____

b.) What is the total number of people the stadium can seat?

19b. _____

20. A diamond is purchased for \$3000. Suppose its value increases by 5% each year. What is the value of the diamond after 10 years?

20. _____

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9.2-9.5 Partner Test

Name Key
Date _____ Hour _____

For exercises 1-2, write the first four terms of each sequence. Classify each formula as an explicit or recursive formula.

1. $a_1 = -2, a_n = a_{n-1} + 7$

1. -2, 5, 12, 19 +2
Explicit Recursive

2. $a_n = 5 + (n-1)(-3)$

2. 5, 2, -1, -4 +2
Explicit Recursive

For exercises 3 - 5, Is it a sequences or series, finite or infinite, arithmetic or geometric or neither?

3. $1 + 5 + 9 + \dots + 33$

+2

4. $18, -6, 2, -2/3, \dots$

+2

5. $1, 3, 6, 10, \dots$

+2

sequence or series
finite or infinite
arith. or geo. or neither

sequence or series
finite or infinite
arith. or geo. or neither

sequence or series
finite or infinite
arith. or geo. or neither

6. For the arithmetic sequence in which $a_4 = 5$ and $a_{10} = 17$, find a_{50}

$(4, 5)$
 $(10, 17)$
 $m = \frac{17-5}{10-4} = \frac{12}{6} = 2 = d$

$a_n = a_1 + (n-1)d$
 $5 = a_1 + (4-1)2$
 $a_1 = -1$

6. $a_{50} = 97$ +3

$a_n = a_1 + (n-1)d$
 $a_n = -1 + (50-1)2$ +3

7. Find the arithmetic mean between 5 and 21.

$\frac{5+21}{2} = \frac{26}{2} = 13$

7. 13

8. Find the geometric mean between 10 and 40.

$\sqrt{10 \cdot 40}$
 $\sqrt{400} = 20$

8. 20 +3

For exercises 9-10, write an explicit formula and recursive formula for each sequence.

9. 97, 86, 75, 64... arithmetic

$$d = -11$$

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

$$= 97 + (n-1)(-11)$$

$$97 - 11n + 11$$

$$\underline{a_n = -11n + 108}$$

9. $\underline{a_n = -11n + 108}$
Explicit formula

$$a_1 = 97$$

$$\underline{a_n = a_{n-1} - 11}$$

Recursive formula

(4)

10. 4, 12, 36, 108...
 $r = 3$

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

10. $\underline{a_n = 4 \cdot 3^{n-1}}$
Explicit formula

$$a_1 = 4$$

$$\underline{a_n = a_{n-1} \cdot 3}$$

Recursive formula

(4)

11. Find a_{14} in the geometric sequence in which

$a_4 = 24$ and $a_7 = 192$

$$a_n = a_1 \cdot r^{n-1}$$
~~$$a_7 = a_4 \cdot r^3$$~~

$$192 = 24 \cdot r^3$$

$$\frac{192}{24} = \frac{24}{24} \cdot r^3$$

$$\sqrt[3]{8} = \sqrt[3]{r^3}$$

$$r = 2$$

$$a_4 = a_1 \cdot r^3$$

$$24 = a_1 \cdot 2^3$$

$$24 = a_1 \cdot 8$$

$$3 = a_1$$

11. $\underline{24,576}$ (4)

$$a_n = 3 \cdot 2^{n-1}$$

$$a_{14} = 3 \cdot 2^{14-1}$$

Write the series in Summation Notation and find the Sum.

12. $\sum_{n=1}^{30} 25 + 32 + 39 + \dots + 228$

$$\sum_{n=1}^{30} \boxed{7n + 18}$$

$$228 = 25 + (n-1)7$$

$$n = 30$$

$$a_n = 25 + (n-1)7$$

$$a_n = 25 + 7n - 7$$

$$7n + 18$$

12. $\sum_{n=1}^{30} 7n + 18$
Summation Notation

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

$$\frac{30}{2} (25 + 228)$$

$$\underline{\text{Sum} = 3795}$$

(5)

Find the sum of the indicated series.

13. $3 + 6 + 12 + 24 + \dots$ for 20 terms ^{finite}

$r=2$

$$\frac{a_1(1-r^n)}{1-r} = \frac{3(1-2^{20})}{1-2}$$

(4)

13. 3,145,725

Find the sum of the indicated series.

14. $\sum_{n=5}^{50} (4n-10)$

$4(5)-10$
 $4(50)-10$
 $200-10$

(4)

14. 4600

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

$$\frac{46}{2}(10+190)$$

15. $\sum_{n=1}^{10} (4)\left(\frac{1}{2}\right)^{n-1}$

$a_1=4$
 $a_2=2$
 $r=\frac{1}{2}$

(4)

15. 7.99 ≈ 8

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

$$\frac{4(1-\frac{1}{2}^{10})}{1-\frac{1}{2}} = 7.99$$

16. $\sum_{n=1}^{\infty} (2)\left(\frac{1}{6}\right)^{n-1}$

$2\left(\frac{1}{6}\right) = \frac{1}{3}$

16. 12/5

(4)

infinite
geo

$$\frac{a_1}{1-r} = \frac{2}{1-\frac{1}{6}} = \frac{2}{\frac{5}{6}} = \frac{2}{1} \cdot \frac{6}{5} = 12/5$$

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

Converge

Does the series converge or diverge. If possible, find the sum.

17. $-15+30-60+120-240\dots$

$|r| = |-2|$
 $r > 1$
diverges
don't do it

17. converge or diverge

18. $12+6+3+\frac{3}{2}+\dots$ infinity

$r = \frac{1}{2}$ converges

18. 24
converge or diverge

$\frac{a_1}{1-r} = \frac{12}{1-\frac{1}{2}} = \frac{12}{\frac{1}{2}} = 24$

19. A football stadium seats 30 people in the first row, 34 in the second row, 38 in the third row and so on. There are 50 rows in the theater.

a.) How many seats are in the 50th row?

$d=4$

19a. 226 seats

$\frac{30}{\text{row 1}} \quad \frac{34}{\text{row 2}} \quad \frac{38}{\text{row 3}} \quad \dots \quad \frac{?}{\text{row 50}}$

$a_{50} = a_1 + (n-1)d$
 $= 30 + (50-1)4$

b.) What is the total number of people the stadium can seat?

19b. 6400 seats

$\frac{n}{2}(a_1 + a_n)$
 $\frac{50}{2}(30 + 226)$

20. A diamond is purchased for \$3000. Suppose its value increases by 5% each year. What is the value of the diamond after 10 years?

$a_1 = 3000$

$a_2 = 3150$

$a_3 =$

$r = 1 + .05$

$r = 1.05$

$a_{10} = 3000(1.05)^{10-1}$
 $3000(1.05)^9$ 20. \$4653.98

Chapter 9 Test
Formulas

Name: _____

1. Recursive Arithmetic: _____
2. Explicit Arithmetic: _____
3. Recursive Geometric: _____
4. Explicit Geometric: _____
5. Finite Sum of an Arithmetic Sequence: _____
6. Finite Sum of a Geometric Sequence: _____
7. Infinite Sum of a Geometric Sequence: _____

Chapter 9 Test
Formulas

Name: _____

1. Recursive Arithmetic: _____
2. Explicit Arithmetic: _____
3. Recursive Geometric: _____
4. Explicit Geometric: _____
5. Finite Sum of an Arithmetic Sequence: _____
6. Finite Sum of a Geometric Sequence: _____
7. Infinite Sum of a Geometric Sequence: _____

Answers

$$1. \begin{cases} a_1 = \\ a_n = a_{n-1} + d \end{cases}$$

$$2. a_n = a_1 + d(n-1)$$

$$3. \begin{cases} a_1 = \\ a_n = (a_{n-1})r \end{cases}$$

$$4. a_n = a_1 r^{n-1}$$

$$5. S_n = \frac{n}{2}(a_1 + a_n)$$

$$6. S_n = a_1 \left(\frac{1-r^n}{1-r} \right)$$

$$7. S_\infty = \frac{a_1}{1-r}$$

Answers

$$1. \begin{cases} a_1 = \\ a_n = a_{n-1} + d \end{cases}$$

$$2. a_n = a_1 + d(n-1)$$

$$3. \begin{cases} a_1 = \\ a_n = (a_{n-1})r \end{cases}$$

$$4. a_n = a_1 r^{n-1}$$

$$5. S_n = \frac{n}{2}(a_1 + a_n)$$

$$6. S_n = a_1 \left(\frac{1-r^n}{1-r} \right)$$

$$7. S_\infty = \frac{a_1}{1-r}$$

