

Warm Up

1. Use the recursive formulas to write the first three terms of each sequence.

$u_0 = 3$ $u_n = u_{n-1} \cdot (-2)$ $n \geq 1$ $u_0 = 3$ $u_1 = -6$ $u_2 = 12$	$u_0 = -7$ $u_n = u_{n-1} - 5$ $n \geq 1$ $u_0 = -7$ $u_1 = -12$ $u_2 = -17$	$u_0 = 80$ $u_n = u_{n-1} \cdot \frac{1}{4}$ $n \geq 1$ $u_0 = 80$ $u_1 = 20$ $u_2 = 5$	$u_0 = -21$ $u_n = u_{n-1} + 20$ $n \geq 1$ $u_0 = -21$ $u_1 = -1$ $u_2 = 19$
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2. Circle the type of sequence, then write the recursive formula if possible.

a. $15, 14, 13, 12, 11$	b. $-6, -13.2, -29.04, -63.8, -140.6$	c. $-1, 3, -7, \dots$
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Arithmetic/Geometric/Neither	Arithmetic/Geometric/Neither	Arithmetic/Geometric/Neither
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Recursive formula:

$$u_0 = 15$$

$$u_n = u_{n-1} - 1$$

$$n \geq 1$$

Recursive formula:

$$u_0 = -6$$

$$u_n = u_{n-1} \cdot 2.2$$

$$n \geq 1$$

Recursive formula:

$$u_0 = -1$$

d. $90, 60, 40, 26.7, 17.8$

e. $-7, -3.7, -0.4, 2.9, 6.2$

f. $10, 44, 193.6, 851.84, 3748.096$

Arithmetic/Geometric/Neither	Arithmetic/Geometric/Neither	Arithmetic/Geometric/Neither
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Recursive formula:

$$u_0 = 90$$

$$u_n = u_{n-1} \cdot \frac{2}{3}$$

$$n \geq 1$$

Recursive formula:

$$u_0 = -7$$

$$u_n = u_{n-1} + 3.3$$

$$n \geq 1$$

Recursive formula:

$$u_0 = 10$$

$$u_n = u_{n-1} \cdot -4.4$$

$$n \geq 1$$

3. Given the following percent of growth or decay, find the common ratio.

a. 43% growth

$$1.43$$

1+decimal

b. 27% decay

$$0.73$$

1-decimal

c. 2.3% decay

$$0.977$$

$$1 - 0.023$$

d. 105% growth

$$2.05$$

$$1 + 1.05$$

6.1 Example A and B – Tape into Notes

Example A: Ms. Taylor has saved \$10,000 and wants to invest it for her daughter's college tuition. She is considering two options. Plan A guarantees a payment, or return, of \$550 each year. Plan B grows by 5% each year. With each plan, what would Ms. Taylor's new balance be after 5 years? After 10 years?

Plan A				Plan B							
Year	Current balance	+	Return	=	New Balance	Year	Current balance	+	Interest (balance x interest rate)	=	New Balance (factored form)
1	10,000	+	550	=	10,550	1	10,000	+	500	=	10,500
2	10,550	+	550	=	11,100	2	10,500	+	X	=	11,025
3	11,100	+	550	=	11,650	3	11,025	+	X	=	11,576.25

Plan A: Ms. Taylor's investment will grow by 550 per year.

Recursive formula:

$$u_0 = 10,000$$

$$u_n = u_{n-1} + 550$$

$$n \geq 1$$

New balance after 5 years: \$12,750

New balance after 10 years: \$15,500

Plan B: The money increases by 5 % each year. So to find the new balance I multiply the previous balance by 1.05

Recursive formula:

$$u_0 = 10,000$$

$$u_n = u_{n-1} \cdot 1.05$$

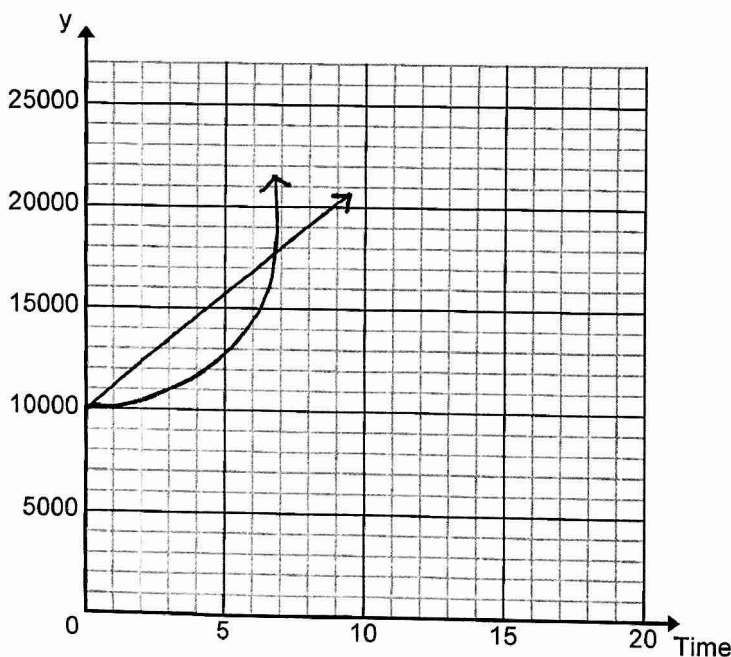
$$n \geq 1$$

New balance after 5 years:

$$\$12,762.82$$

New balance after 10 years:

$$\$16,288.95$$



Example B: Birdbaths at the Feathered Friends store are marked down 35%. What is the cost of a birdbath that was originally priced \$34.99? What is the cost if the birdbath is marked down 35% a second time?

One 35% mark down price:

$$34.99(0.65) = \$22.74$$

Two 35% mark downs price:

$$22.74(0.65) = \$14.78$$