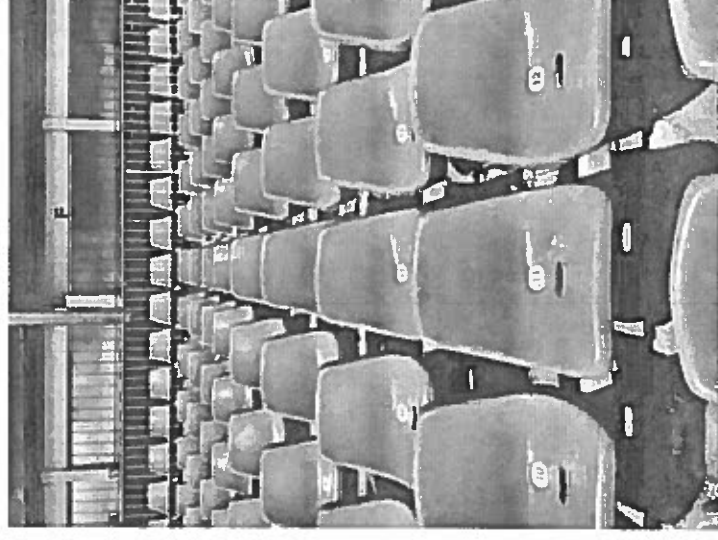


Robertson Theater's front row contains 40 seats. Each row has 2 more seats than the row in front of it. How many seats are in the 50th row of the theater?



- A) 138 go to 5
- B) 142 go to 11
- C) 140 go to 6
- D) 80 go to 9
- E) 112 go to 8

1) 1st term: 2nd term: 3rd term: ~~*~~ Arithmetic

40 42 44 ...
 ↗ ↗ ↗
+2 +2 +2

$$a_1 = 40$$

$$d = +2$$

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

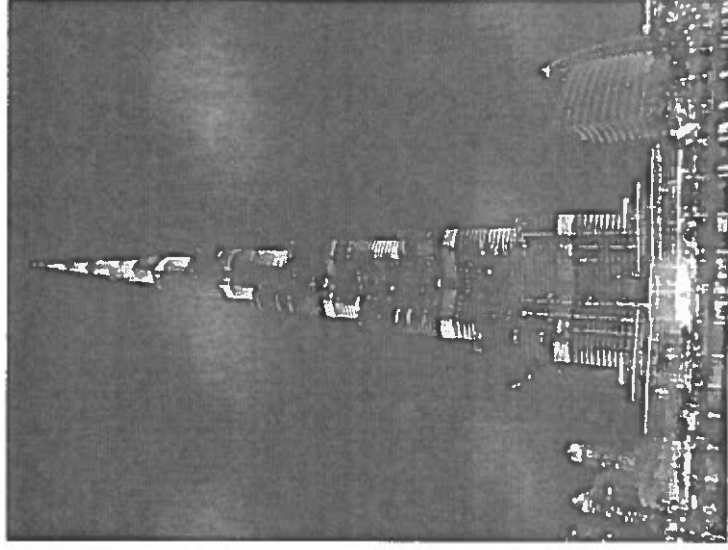
$$a_{40} = 40 + (50-1)(2)$$

$$a_{40} = 138$$

90 to 5

2

When dropped, a golf ball bounces to 75% of its previous height on each successive bounce. Someone drops a golf ball from the top of Burj Khalifa in Dubai, and its first bounce reaches 2041.5 feet. What is the peak height of the ball after the tenth bounce?



- A) 273 ft. go to 1
- B) 204 ft. go to 5
- C) 153 ft. go to 4
- D) 114 ft. go to 11
- E) 340 ft. go to 8

$$2) 1^{\text{st}} \text{ bounce} = 2041.5$$

$$r = 0.75$$

Geometric

$$a_n = a_1 (r)^{n-1}$$

$$a_{10} = 2041.5 (0.75)^{10-1}$$

$$a_{10} = 153.28$$

go to station 4

3

Write the explicit function that represents this bank account.

<u>month</u>	<u>balance</u>
1	\$ 1,000
2	\$ 1,040
3	\$ 1,082

- A) $a_n = 1000(104)^{n-1}$ go to 10
- B) $a_n = 1000(1.04)^{n-1}$ go to 11
- C) $a_n = 1000 + 104(n - 1)$ go to 1
- D) $a_n = 1000 + 1.04(n - 1)$ go to 8
- E) $a_n = 104 + 1000(n - 1)$ go to 3



3)

month	balance
1	1000
2	1040
3	1082

$\times 1.04$

$\times 1.04$

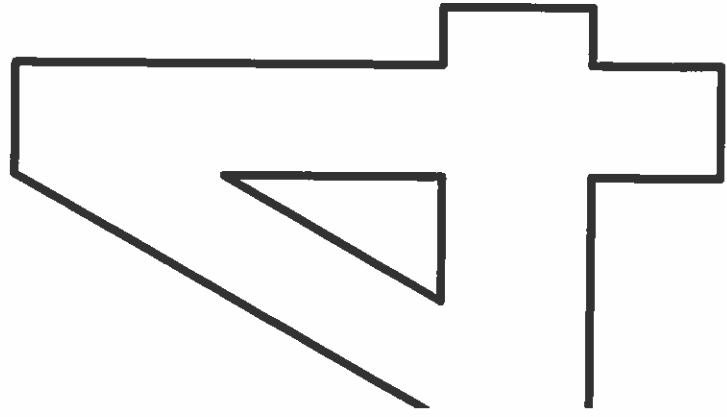
This is Geometric (increasing by 1.04).

C, D, E are Arithmetic, so they must be wrong.

A is geometric, but the r is too big.

\therefore the answer is B,

Go to 11



Lydia gets \$5 each week from her grandmother. She hides her money under her mattress and never spends it. After one week, Lydia's mattress currently hides \$100. How much money will be there in one year (52 weeks)?

- A) \$345 go to 3
- B) \$350 go to 5
- C) \$355 go to 10
- D) \$360 go to 7
- E) \$365 go to 11



4) Arithmetic

$$a_1 = 100$$

$$d = +5$$

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

$$a_{52} = 100 + (52-1)(5)$$

$$a_{52} = 355$$

go to station 10

5

An electrical short occurs in your 100-degree hot tub at noon. It causes the water to increase in temperature 10% each hour. When will you be able to boil an egg in your hot tub? (212 degrees)

- A) 5:00 go to 2
- B) 6:00 go to 10
- C) 7:00 go to 8
- D) 8:00 go to 3
- E) 9:00 go to 4



5)

12 pm	100°	1 st term
1 pm	110°	
2 pm	121°	
3 pm	133.1°	
4 pm	146°	
5 pm	161°	
6 pm	177°	
7 pm	194.9°	
8 pm	214°	

an increase of 10% means $r = 1.10\%$

$$a_1 = 100$$

$n-1$

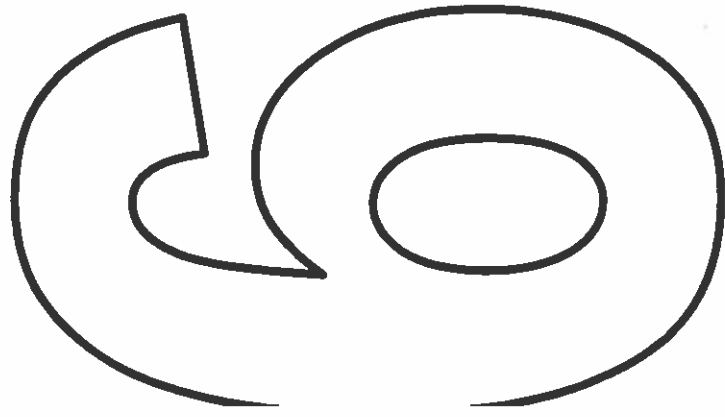
$$a_n = a_1 (r)^{n-1}$$

$$212 = 100 (1.10)^{n-1}$$

we don't currently know how to solve for an exponent, so try guess and check or table of values.

∴ it will reach 212° by 8 pm,

so go to station 3.



Israel can do 25 push-ups on day 1 of his workout. He believes that he can increase this number by three push-ups each day since he has begun lifting weights. On day 17, how many push-ups would Israel be able to do?

- A) 76 go to 1
- B) 59 go to 5
- C) 93 go to 3
- D) 73 go to 2
- E) 79 go to 8

6) Arithmetic

$$a_1 = 25$$

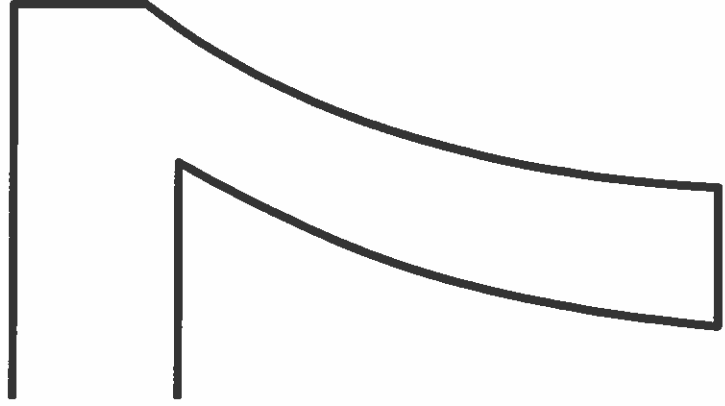
$$d = +3$$

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

$$a_{17} = 25 + (17-1)(+3)$$

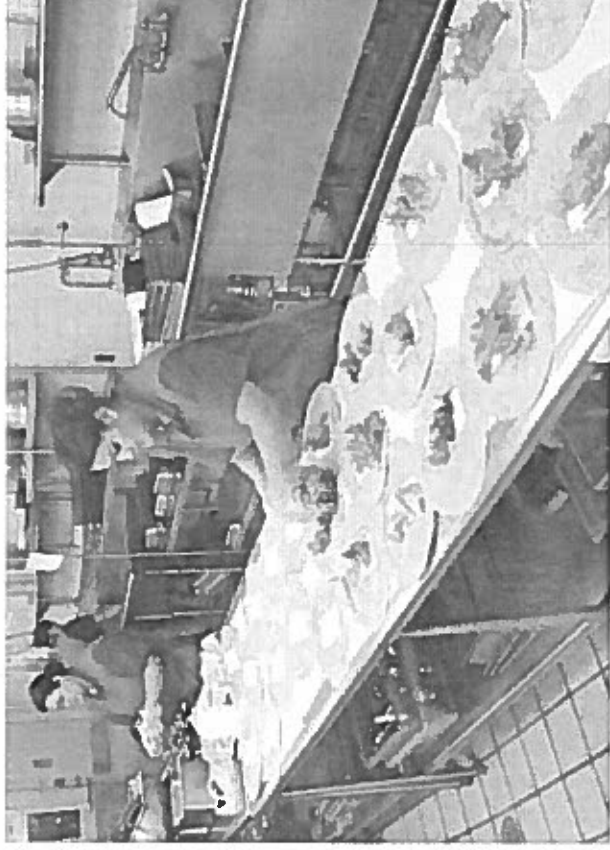
$$a_{17} = 73$$

go to station 2

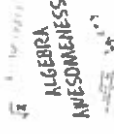


Elena gets a job making burritos. She makes \$9 per hour, because of a bonus for starting work on the day that she is hired, she has \$59 after working just one hour. How much does Elena earn after working 32 hours?

- A) \$338 go to 6
- B) \$306 go to 1
- C) \$370 go to 5
- D) \$288 go to 8
- E) \$329 go to 10



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7) If she makes 9\$/hour, but has 59\$ after working one hour, her bonus must be 50\$.

Arithmetic

$a_1 = 59$ (what she has earned after working 1 hour)

$$d = +9$$

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

$$a_{32} = 59 + (32-1)(+9)$$

$$a_{32} = 338 \text{ \$}$$

go to station 6

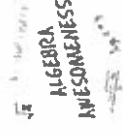
8

Lindsey studies a type of cell that splits into two cells every hour. She begins observing one cell at 9:00am. How many cells are there at 5:00pm?

- A) 256 go to 1
- B) 15 go to 7
- C) 128 go to 6
- D) 19 go to 9
- E) 64 go to 8



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8)

9am	1 cell	$\downarrow \times 2$	1 st term
10am	2 cells	$\downarrow \times 2$	2 nd term
11am	4 cells	$\downarrow \times 2$	3 rd term
12pm	8 cells		
1pm	16		
2pm	32		
3pm	64		
4pm	128		
5pm	256		

go to station 1

or

5pm is in 8 hours from the start

time zero is 9am \rightarrow 1 cell

1st term 2 cells (in 1 hour from start)

$$r = \times 2$$

$$a_n = a_1 (r)^{n-1}$$

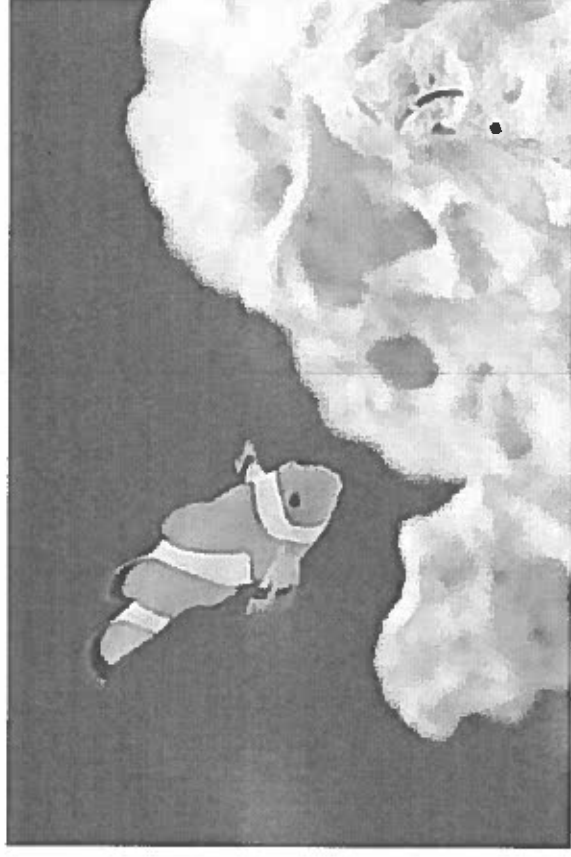
$$a_8 = 2 (2)^{8-1}$$

$$a_8 = 256$$

9

A leak in an aquarium causes it to lose 0.75 gallons per hour. 1000 gallons remain after one hour. How many gallons will be in the aquarium after one day?

- A) 1.75 go to 1
- B) 17.25 go to 10
- C) 998.36 go to 3
- D) 982.75 go to 7
- E) 1017.25 go to 8



9)

Arithmetic

$$a_1 = 1000$$

$$d = -0.75$$

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

$$a_{24} = 1000 + (24-1)(-0.75)$$

$$a_{24} = 982.75 \text{ L}$$

go to station 7

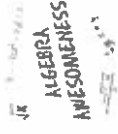
10

Steve's IQ increases by 0.25% each day that he attends his algebra class. After the first day of class, he has an IQ of 90. What will it be after attending all 180 classes this year?

- A) 269 go to 2
- B) 141 go to 8
- C) 314 go to 11
- D) 200 go to 6
- E) 127 go to 9



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10) Geometric

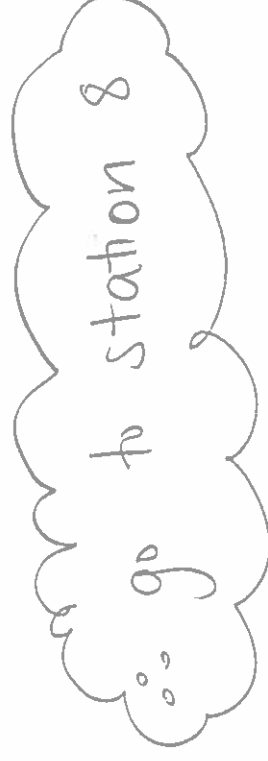
$$a_1 = 90$$

$$r = 1.0025$$

$$a_n = a_1 (r)^{n-1}$$

$$a_{180} = 90 (1.0025)^{180-1}$$

$$a_{180} = 140.7$$



$$0.25\% = 0.0025 \text{ as a decimal} \\ (\text{divide by } 100)$$

$$\therefore r = 1.0025$$

11

A swimmer begins the season with a time of 9:58 for her race. She is able to swim three seconds faster each day of the season. What will her time be on the 22nd day?

- A) 5:35 go to 2
- B) 11:05 go to 10
- C) 8:55 go to 9
- D) 7:40 go to 8
- E) 9:05 go to 5



11) 9 minutes and 58 sec \Rightarrow 598 seconds $(9 \times 60) + 58$

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

$$a_1 = 598$$

$$d = -3$$

$$a_{22} = 598 + (22-1)(-3)$$

$$a_{22} = 535 \text{ seconds}$$

Since there are 60 seconds in each min,

$$60 \times 8 = 480$$

$$535 - 480 = 55$$

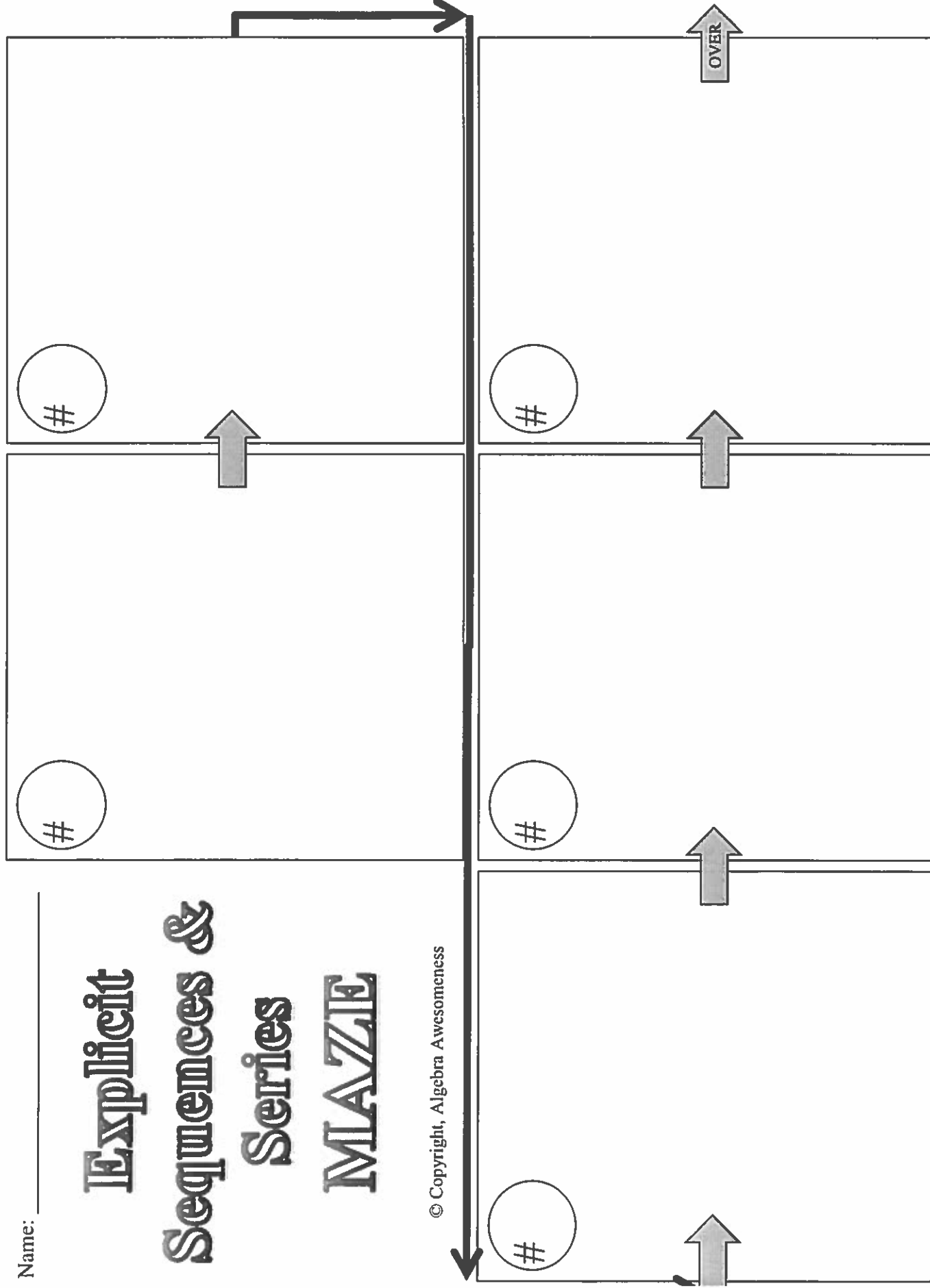
\therefore 8 min 55 seconds.

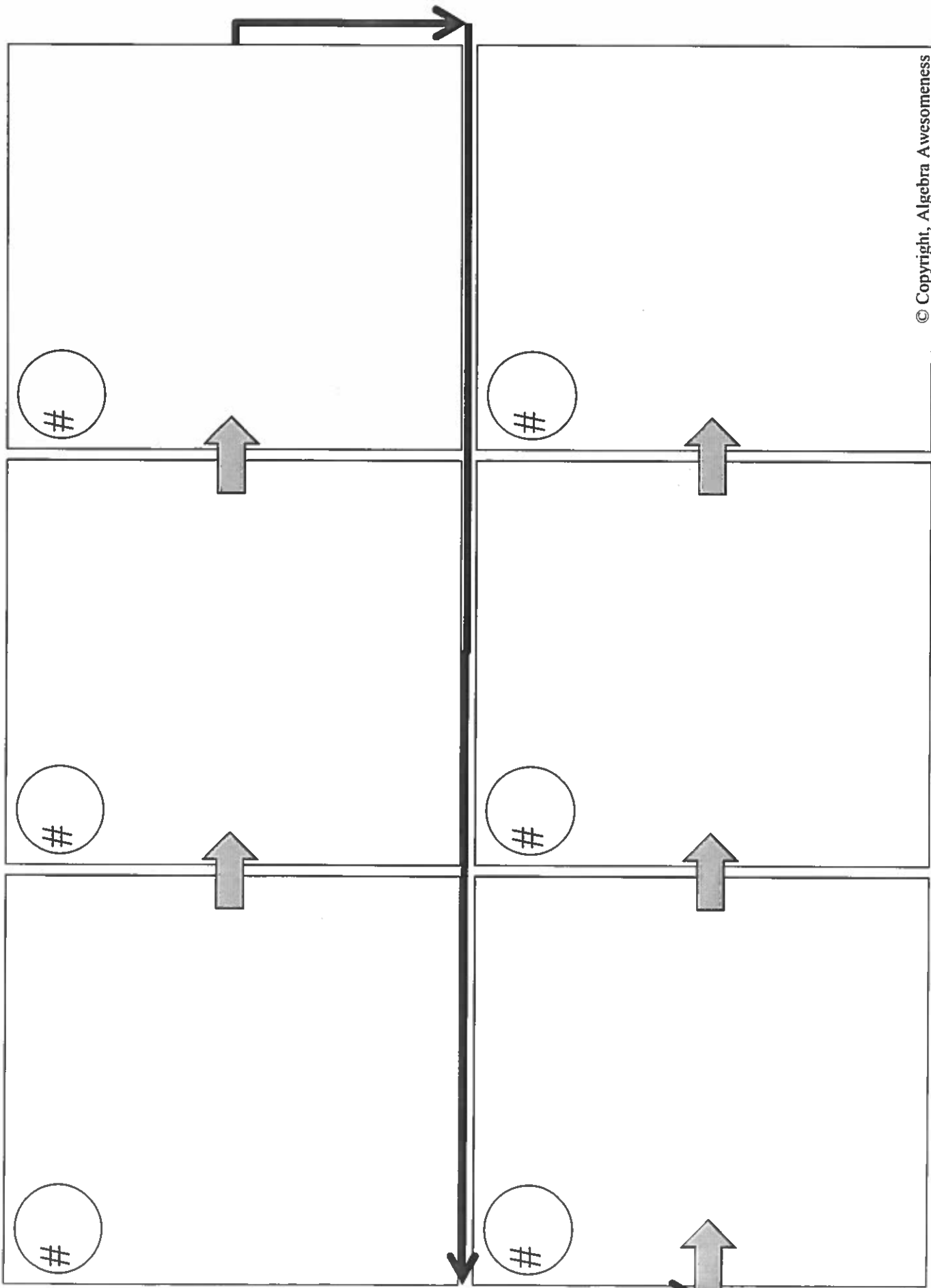
Go to station 9

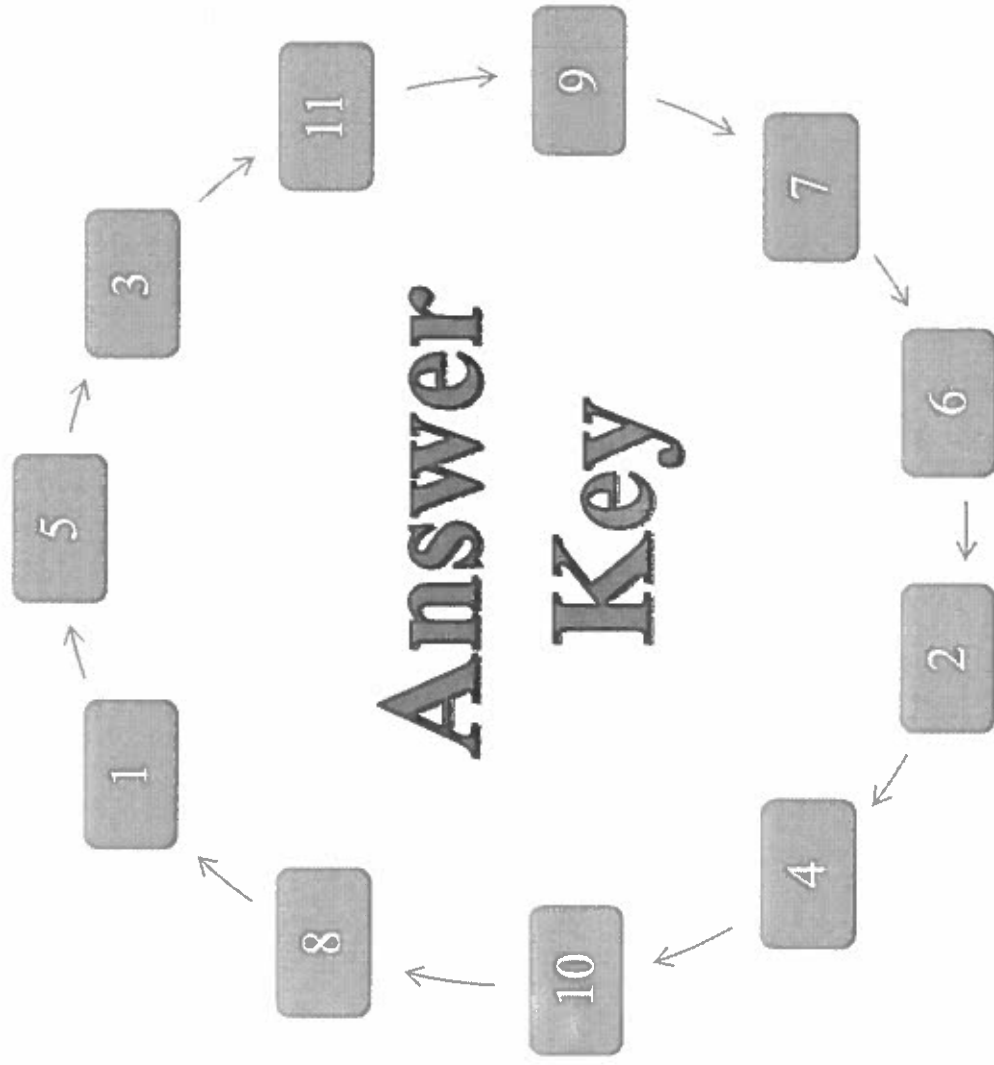
Name: _____

Explicit Sequences & Series MAZE

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Answer Key

Begin with the student's group number. Follow the arrows to determine which station they should have visited next. For example, a student in group #7 should have begun with station #7. He should then travel to #6, followed by #2, then #4, and so on, until they have completed all 11 stations in order.