

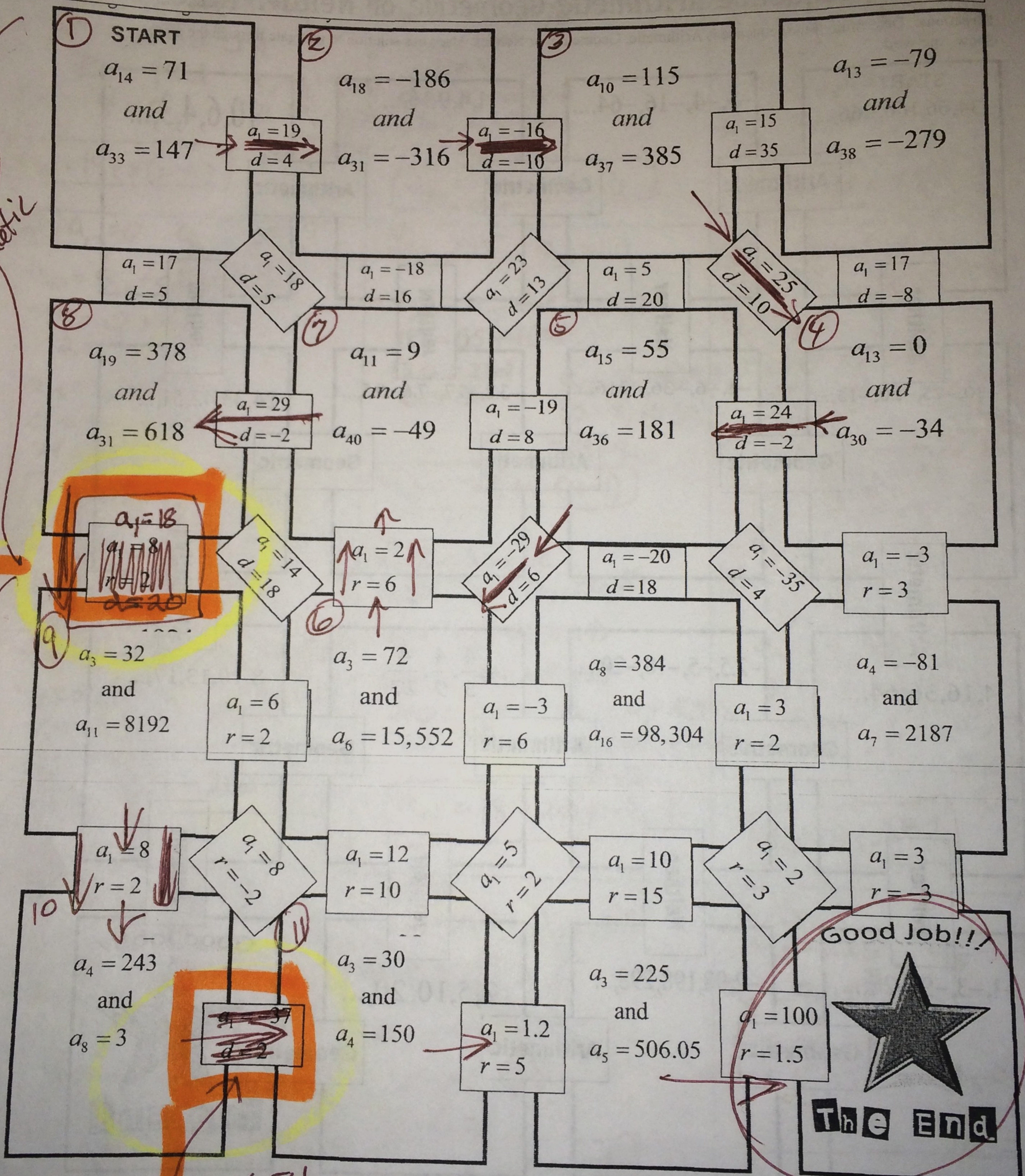
Arithmetic and Geometric Maze

Name Key

On the back, write the explicit equation for each sequence. The top 8 are ARITHMETIC and the bottom 8 are GEOMETRIC. Then find the first term and the common difference OR ratio. Use your solution to navigate through the maze. SHOW YOUR WORK ON THE BACK!!!!

Arithmetic

Geometric



$a_1 = 6561$
 $r = \frac{1}{3}$

Arithmetic and Geometric Maze

SHOW WORK HERE!

① $a_{14} = 71$ $a_{33} = 147$

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

$$a_{33} = a_{14} + d(33-14)$$

$$147 = 71 + d(19)$$

$$76 = 19d$$

$$4 = d$$

$$a_{14} = a_1 + 4(14-1)$$

$$71 = a_1 + 4(13)$$

$$71 = a_1 + 52$$

$$19 = a_1$$

$$a_n = 19 + 4(n-1)$$

② $a_{18} = -186$ $a_{31} = -316$

$$a_{31} = a_{18} + d(31-18)$$

$$-316 = -186 + d(13)$$

$$-130 = 13d$$

$$-10 = d$$

$$a_{18} = a_1 - 10(18-1)$$

$$-186 = a_1 - 170$$

$$-16 = a_1$$

$$a_n = -16 - 10(n-1)$$

③ $a_{10} = 115$ $a_{37} = 385$

$$a_{37} = a_{10} + d(37-10)$$

$$385 = 115 + d(27)$$

$$270 = 27d$$

$$10 = d$$

$$a_{10} = a_1 + d(10-1)$$

$$115 = a_1 + 10(9)$$

$$25 = a_1$$

$$a_n = 25 + 10(n-1)$$

④ $a_{13} = 0$ $a_{30} = -34$

$$a_{30} = a_{13} + d(30-13)$$

$$-34 = 0 + d(17)$$

$$-2 = d$$

$$a_{13} = a_1 + d(13-1)$$

$$0 = a_1 - 2(12)$$

$$24 = a_1$$

$$a_n = 24 - 2(n-1)$$

⑤ $a_{15} = 55$ $a_{36} = 181$

$$a_{36} = a_{15} + d(36-15)$$

$$181 = 55 + d(21)$$

$$126 = 21d$$

$$6 = d$$

$$a_{15} = a_1 + d(15-1)$$

$$55 = a_1 + 6(14)$$

$$-29 = a_1$$

$$a_n = -29 + 6(n-1)$$

⑥ Geometric

$$a_3 = 72$$
 $a_6 = 15,552$

$$a_6 = a_3 r^{6-3}$$

$$15,552 = 72 \cdot r^3$$

$$216 = r^3$$

$$6 = r$$

$$a_3 = a_1 r^{3-1}$$

$$72 = a_1 \cdot 6^2$$

$$2 = a_1$$

$$a_n = 2(6)^{n-1}$$

⑦ Arithmetic

$$a_{11} = 9$$
 $a_{40} = -49$

$$a_{40} = a_{11} + d(40-11)$$

$$-49 = 9 + d(29)$$

$$-58 = 29d$$

$$-2 = d$$

$$a_{11} = a_1 + d(11-1)$$

$$9 = a_1 + 2(10)$$

$$29 = a_1$$

$$a_n = 29 - 2(n-1)$$

⑧ Arithmetic

$$a_{19} = 378$$
 $a_{31} = 618$

$$a_{31} = a_{19} + d(31-19)$$

$$618 = 378 + d(12)$$

$$240 = 12d$$

$$20 = d$$

$$a_{19} = a_1 + d(19-1)$$

$$378 = a_1 + 20(18)$$

$$18 = a_1$$

$$a_n = 18 + 20(n-1)$$

⑨ Geom.

$$a_3 = 32$$
 $a_{11} = 8192$

$$a_{11} = a_3 r^{11-3}$$

$$8192 = 32 r^8$$

$$256 = r^8$$

$$2 = r$$

$$a_3 = a_1 r^{3-1}$$

$$32 = a_1 (2)^2$$

$$8 = a_1$$

$$a_n = 8(2)^{n-1}$$

⑩ $a_4 = 243$ $a_8 = 3$

$$a_8 = a_4 (r)^{8-4}$$

$$3 = 243 (r)^4$$

$$\frac{1}{81} = r^4$$
 $a_4 = a_1 (r)^{4-1}$

$$\frac{1}{3} = r$$
 $243 = a_1 (\frac{1}{3})^3$

$$6561 = a_1$$

$$a_n = 6561 r^{n-1}$$

⑪ G:

$$a_3 = 30$$
 $a_4 = 150$

$$r = \frac{150}{30} = 5$$

$$a_3 = a_1 (r)^{3-1}$$

$$30 = a_1 (5)^2$$

$$1.2 = a_1$$

$$a_n = 1.2 (5)^{n-1}$$

⑫ G

$$a_3 = 225$$
 $a_5 = 506.05$

$$a_5 = a_3 (r)^{5-3}$$

$$506.05 = 225 r^2$$

$$1.5 = r$$

$$a_3 = a_1 (r)^{3-1}$$

$$225 = a_1 (1.5)^2$$

$$100 = a_1$$

$$a_n = 100 (1.5)^{n-1}$$