

STEPPING STONES

FESTIVAL GUIDE

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Mathematics
Festival**

Materials and Setup

Per table (assuming 5 students per table), you will need:

Per Table		Material Preparation	
50 colored counters			
50 number stickers (need five sets of numbers 2 to 11)		Using one color for each set, put the numbers 2 - 11 on the counters.	
3 copies of Instructions		1-page sheet	p. 6
5 copies of Stepping Stones Number Set		1-page sheet	p. 7
5 copies of Tasks		8 pages <i>can be printed double-sided</i>	p. 8-15
1 copy of Table Sign		1-page sheet <i>print on cardstock for sturdiness</i>	p. 16

Per Table		Purchasing Materials	
colored counters	pack of 135 for \$8.49		
number stickers	pack of 2500 for \$6.49		You could also write the numbers directly on the counters using permanent marker.
28 plastic sheet protectors	pack of 100 for \$7.67	pack of 500 for \$26.99	These are recommended in order to protect the documents that students will be handling.



Objective

Place all the given numbers into the grid.

Rules:

1. Place numbers in order, one at a time. Start with 2, then 3, then 4, and so on.
2. A number can only be placed in a square if it is the sum of all the numbers that are one space away (vertically, horizontally, and diagonally).

Materials

Each Stepping Stones table should be prepped for 5 stations.

Each station needs:

1. Colored counters numbered 2 through 11.
2. Stepping Stones instructions.
3. Stepping Stones number set sheet.
4. Stepping Stones tasks.

How to Play

Introduce the activity without overexplaining it and without telling what strategies students might want to use. As much as possible, avoid giving away answers. Students should be encouraged to explore, experiment, and learn from their mistakes.

1. Have the numbered counters laid out on the Number Set sheet or, with young students, have them place the number counters on the correct place on the sheet for you.
2. Demonstrate the rules by placing number circles on the first puzzle and showing the student how to find the sums around it.
3. Have the student help you place the first few numbers. Point out that completed puzzles will have empty circles - not all the circles have to have numbers in them.
4. Have the student solve the first task and then explore the next tasks.

Standards

1. Make sense of problems and persevere in solving them. CCSS.MP1
2. Model with mathematics. CCSS.MP4
3. Attend to precision. CCSS.MP6
4. Look for and express regularity in repeated reasoning. CCSS.MATH.PRACTICE.MP8



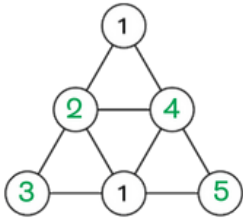
Asking Good Questions

1. Ask questions about confidence.
 - a. When a student asks you “Is this right?”, instead of saying “yes” or “no” right away, ask them how confident they are in their answer. Here are some examples:
 - i. “Maybe. What do you think? How confident are you?”
 - ii. “On a scale of 1-5, how confident are you in your answer?”
 - b. If a student is not confident in their answer, follow up by asking “What would help you feel more confident in your answer?” or “Why do you not feel confident?” This helps you determine how best to help the student through their explorations.
2. Ask students about choices.
 - a. When a student is stuck or shows you a wrong answer, instead of jumping in and showing the student the correct answer, start by asking about the choices that the student made along the way. Here are some suggested steps to follow:
 - i. Start from the beginning.
 - ii. Ask students to show you what they’ve tried so far.
 - iii. When the student gets to a point where they have different choices, ask the student “What other choices can you make here?”
 - iv. Have the student make a different choice and try to solve the puzzle. This helps the student see that they have the power to make different choices during an activity, and they’ll start to do this on their own in the future.
 - v. If you’re familiar with the puzzle or a particular solution, stop the student only when a different choice will help them get to the solution. This will help them feel successful faster without you giving away too much of the answer.
3. Ask students about strategies.
 - a. If a student is getting into the activity and has been doing it for a while, ask the student if there are any strategies they’ve come up with to help them solve the puzzle or win the game.
 - b. Follow up by asking if they think their strategies will work for all puzzles and/or larger puzzles, more complex puzzles, etc. Have the student explore more complex puzzles to test out their strategies.
 - c. This is a great way to encourage a student to dive deeper into an activity and to start looking for patterns, structure, and proofs.

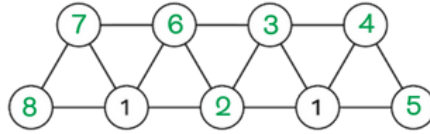
Answers

Most puzzles have more than one solution, so answers may vary.

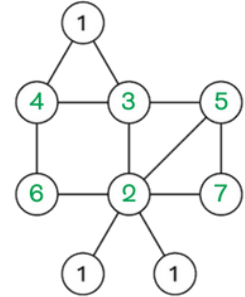
Puzzle 1



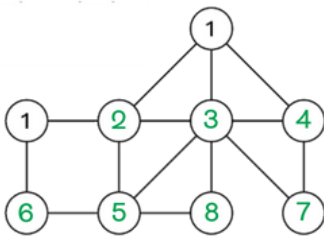
Puzzle 2



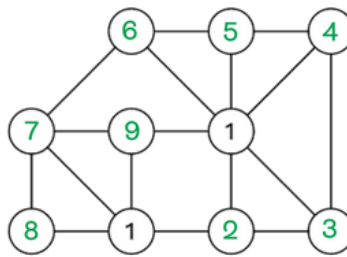
Puzzle 3



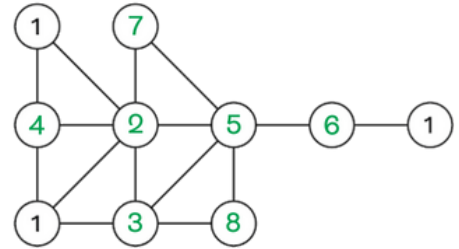
Puzzle 4



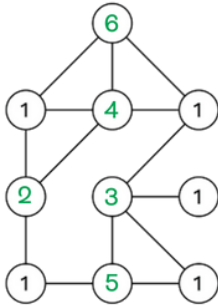
Puzzle 5



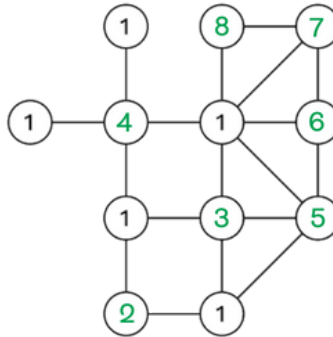
Puzzle 6



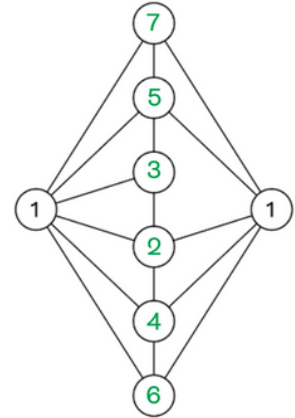
Puzzle 7



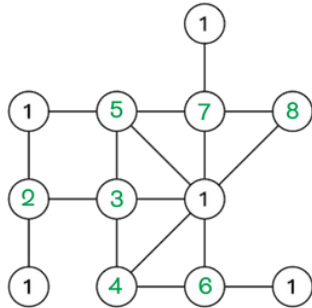
Puzzle 8



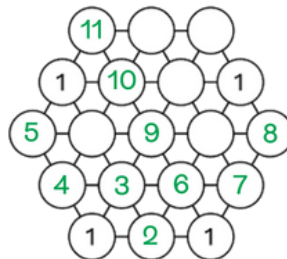
Puzzle 9



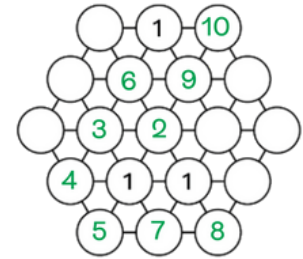
Puzzle 10



Puzzle 11



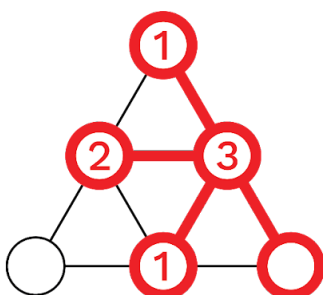
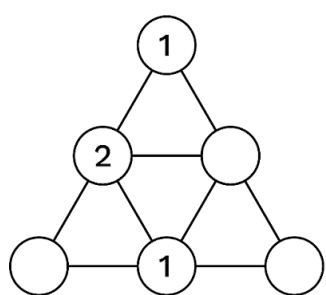
Puzzle 12



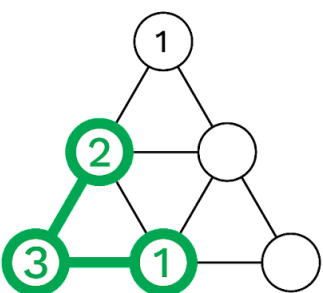
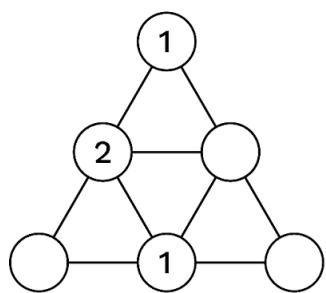
Stepping Stones Instructions

Rules:

1. Every empty circle needs a number.
2. Place numbers in order from smallest to largest. Start with 2, then 3, then 4, and so on.
3. When a number is placed, it must be the sum of the numbers connected to it.



3 cannot be placed here
because $1 + 2 + 1 \neq 3$.



3 can be placed here
because $1 + 2 = 3$.

4. A number only needs to follow rule #3 the moment it is placed. After a number is placed, you don't need to worry about it anymore.

Stepping Stones Numbers

2

3

4

5

6

7

8

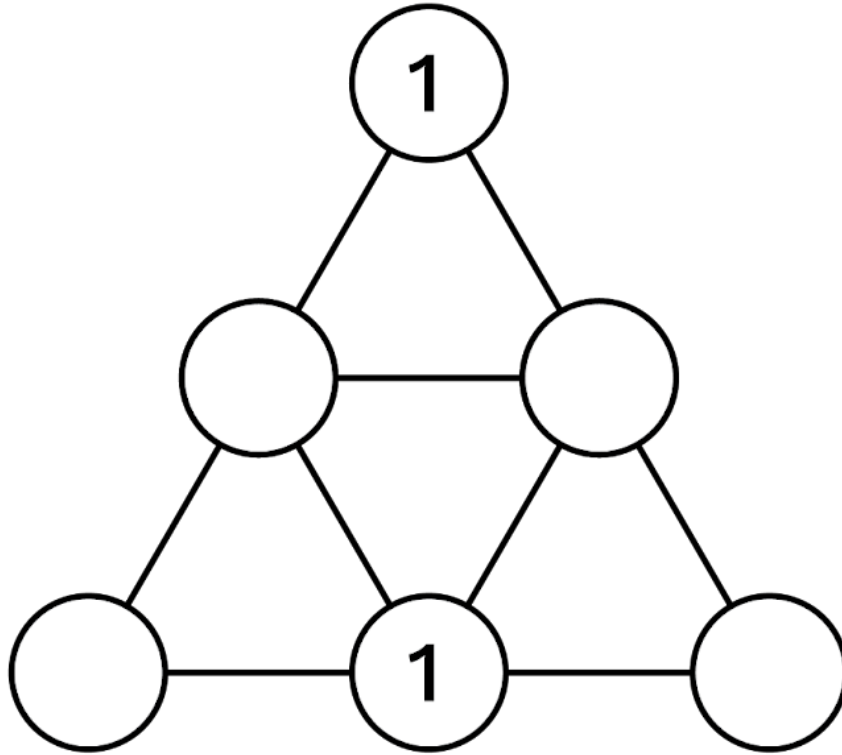
9

10

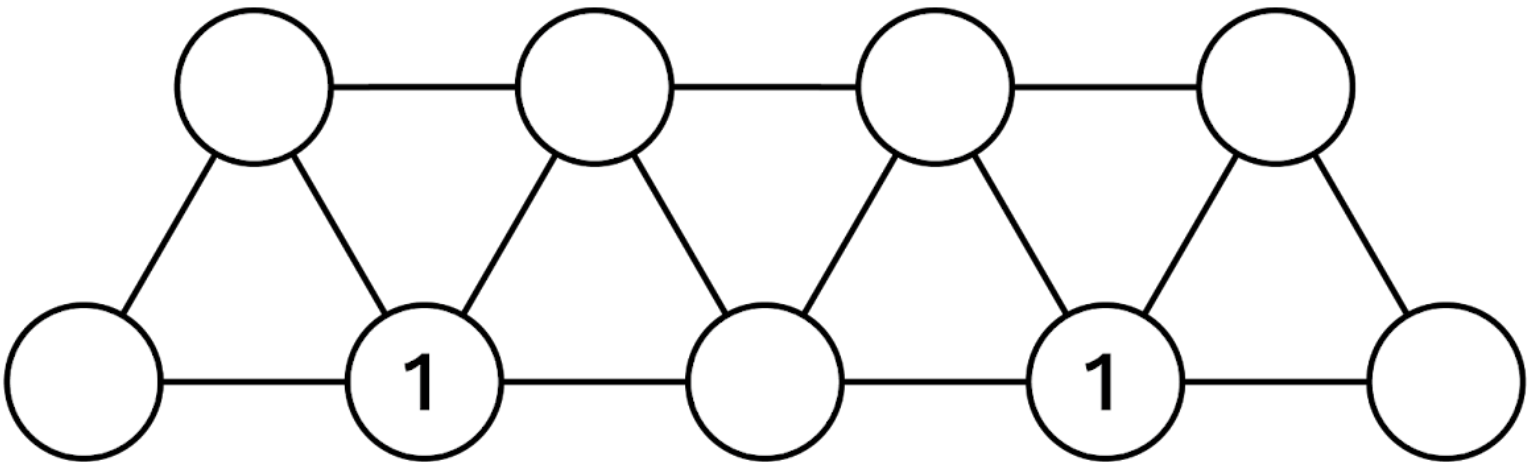
11

Stepping Stones Tasks

Puzzle 1

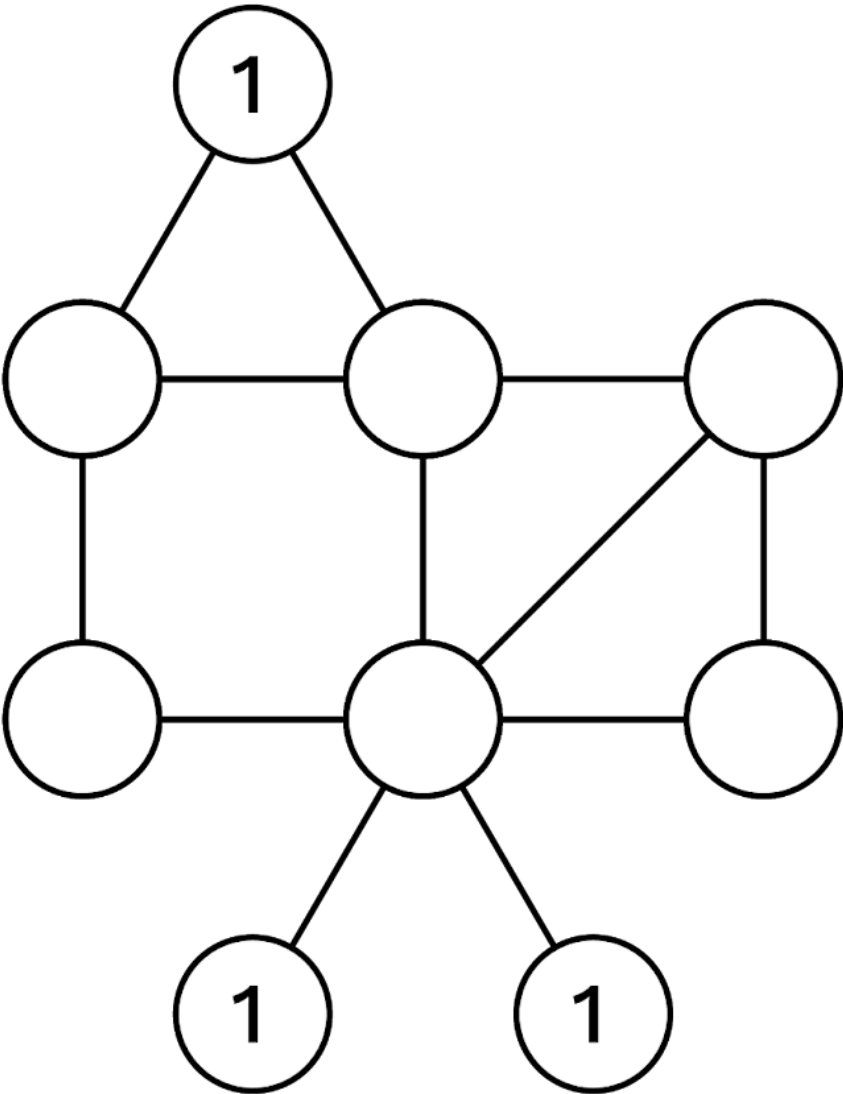


Puzzle 2

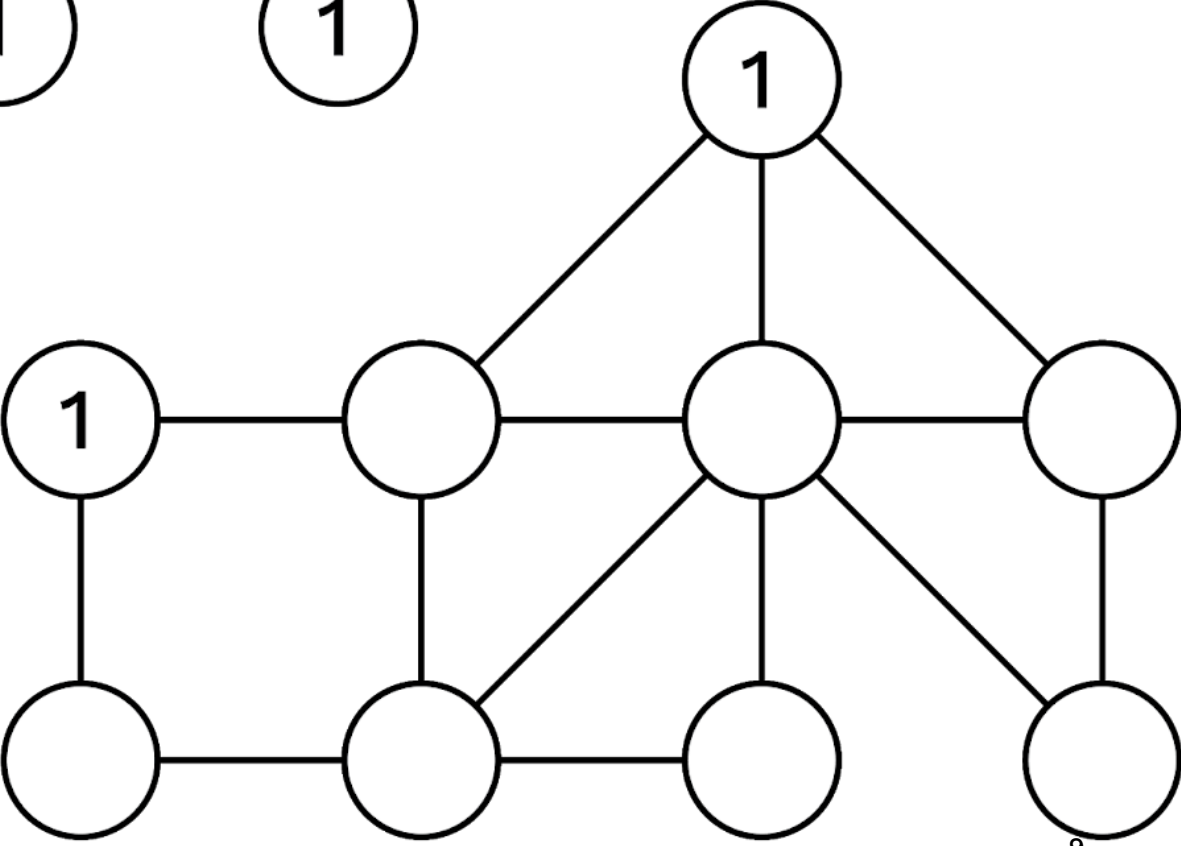


Puzzle 3

Stepping Stones Tasks

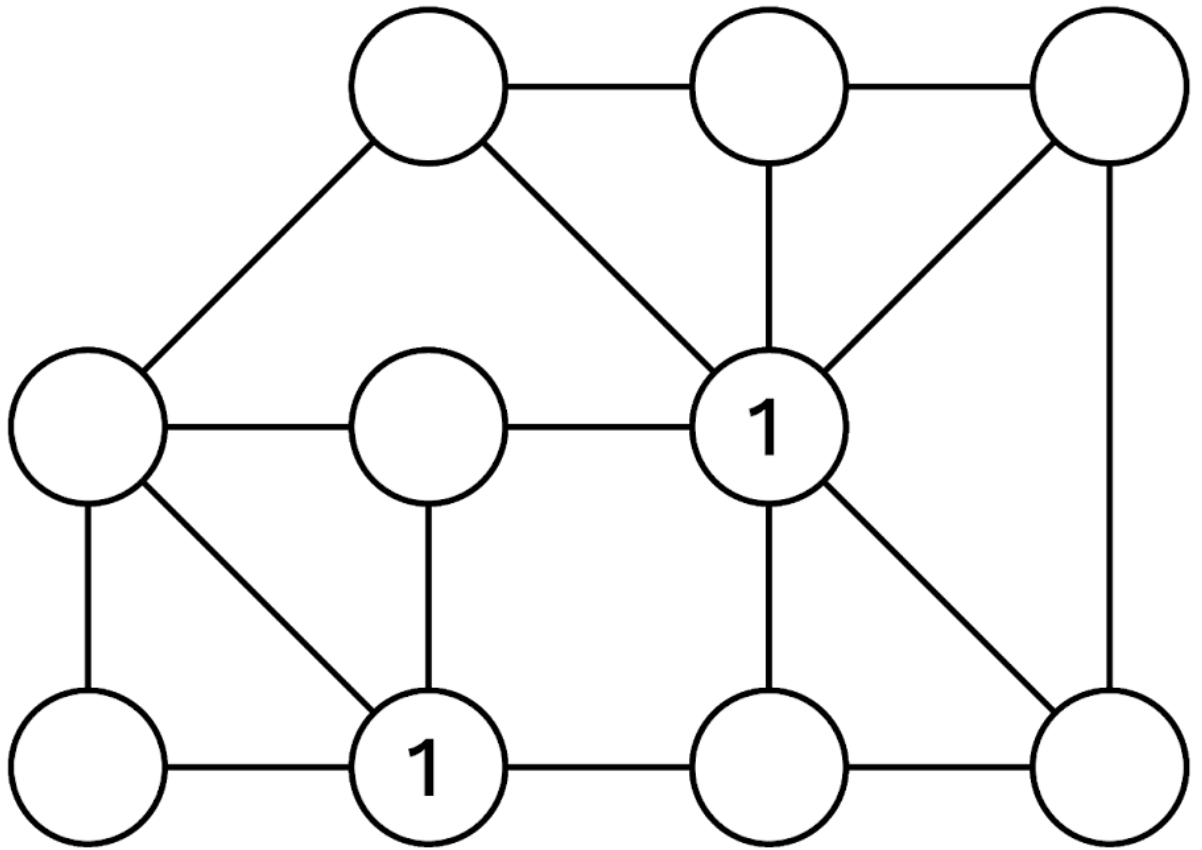


Puzzle 4

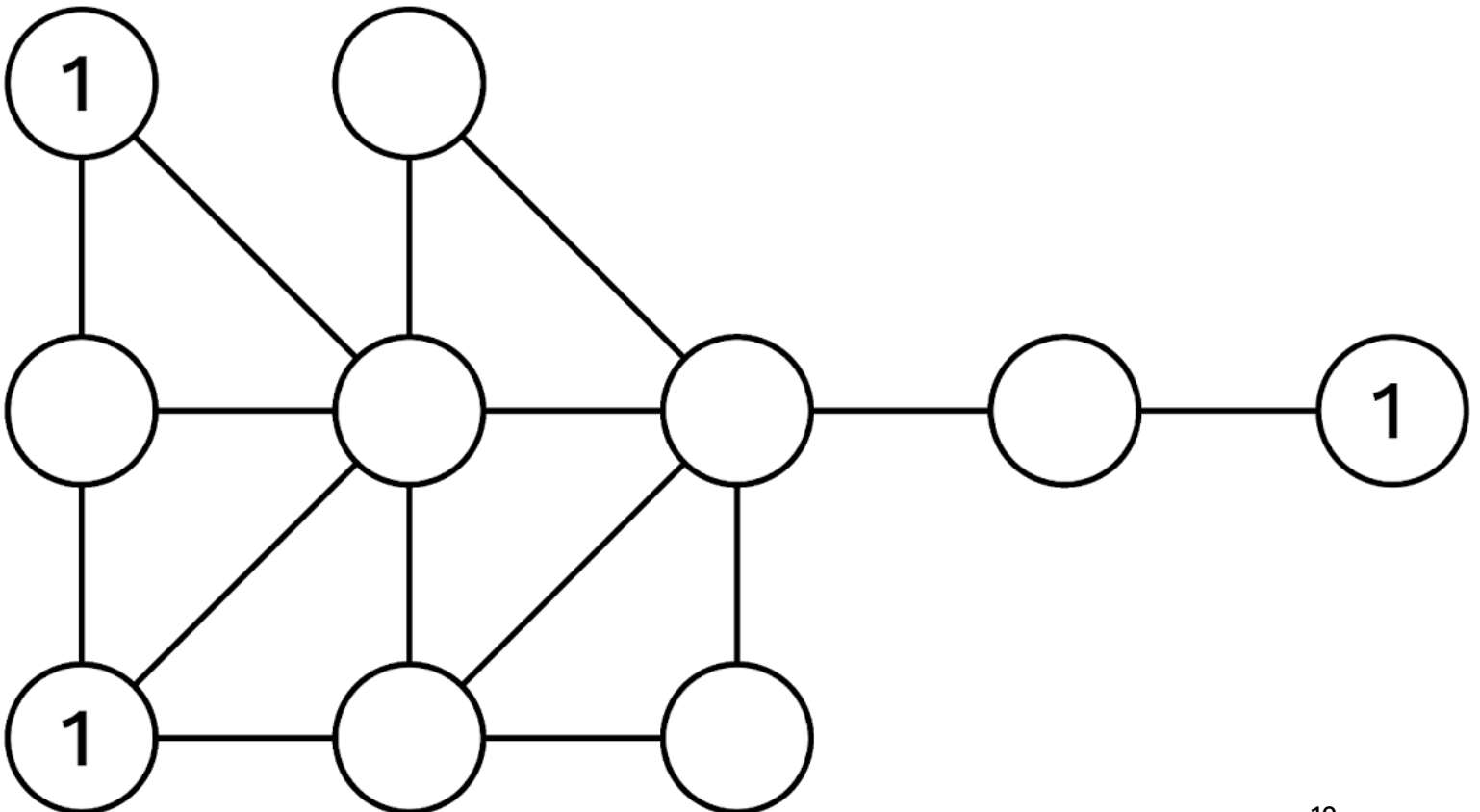


Stepping Stones Tasks

Puzzle 5

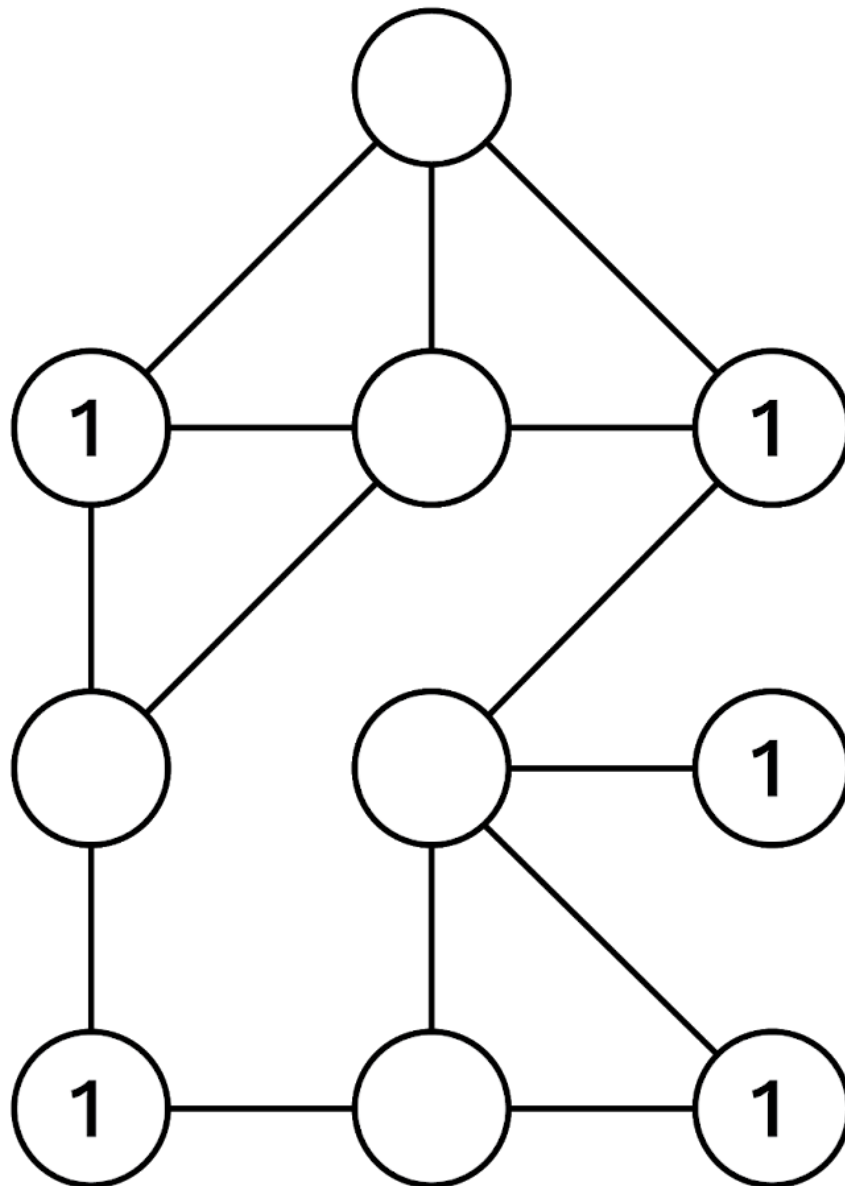


Puzzle 6



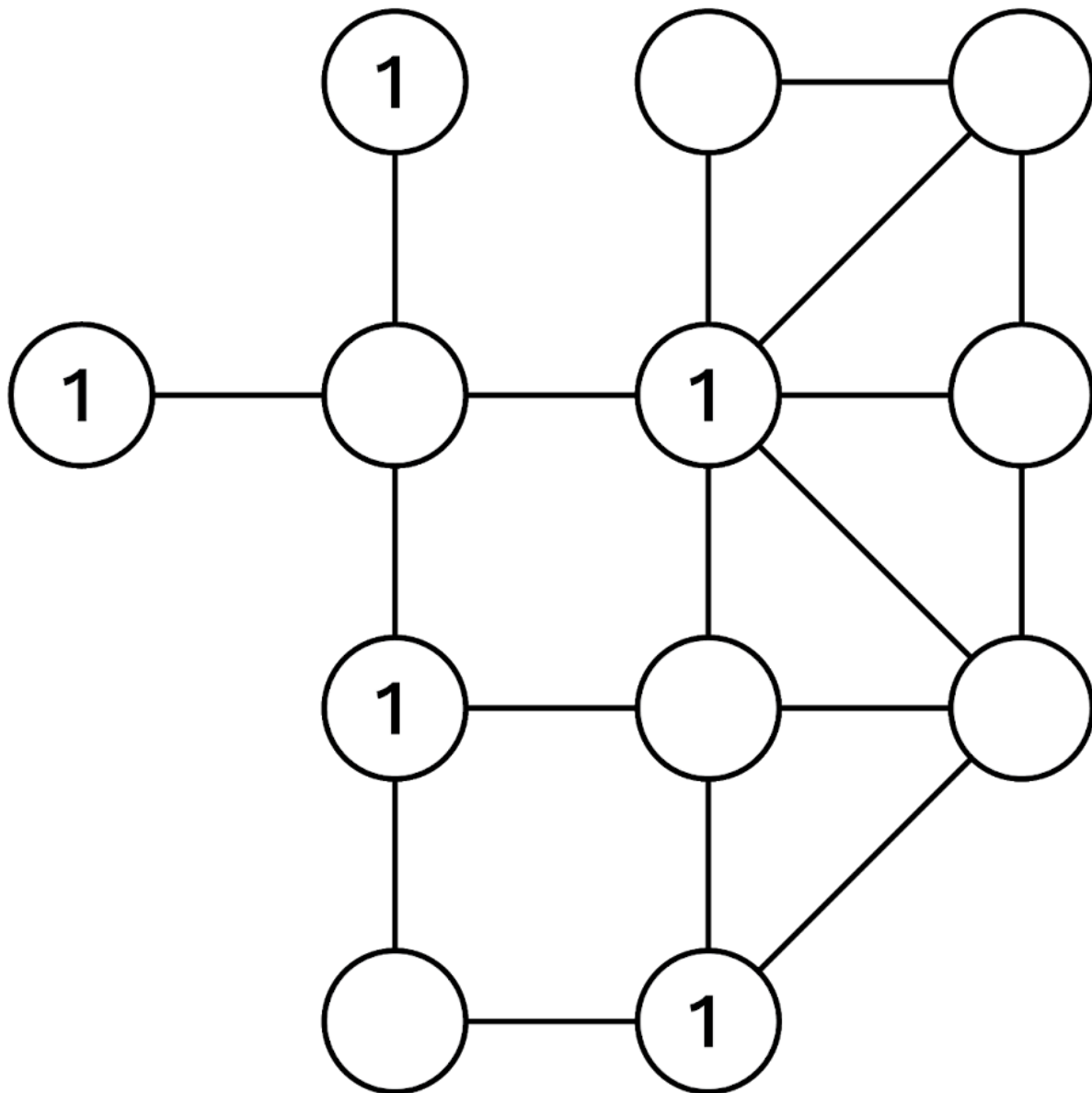
Stepping Stones Tasks

Puzzle 7



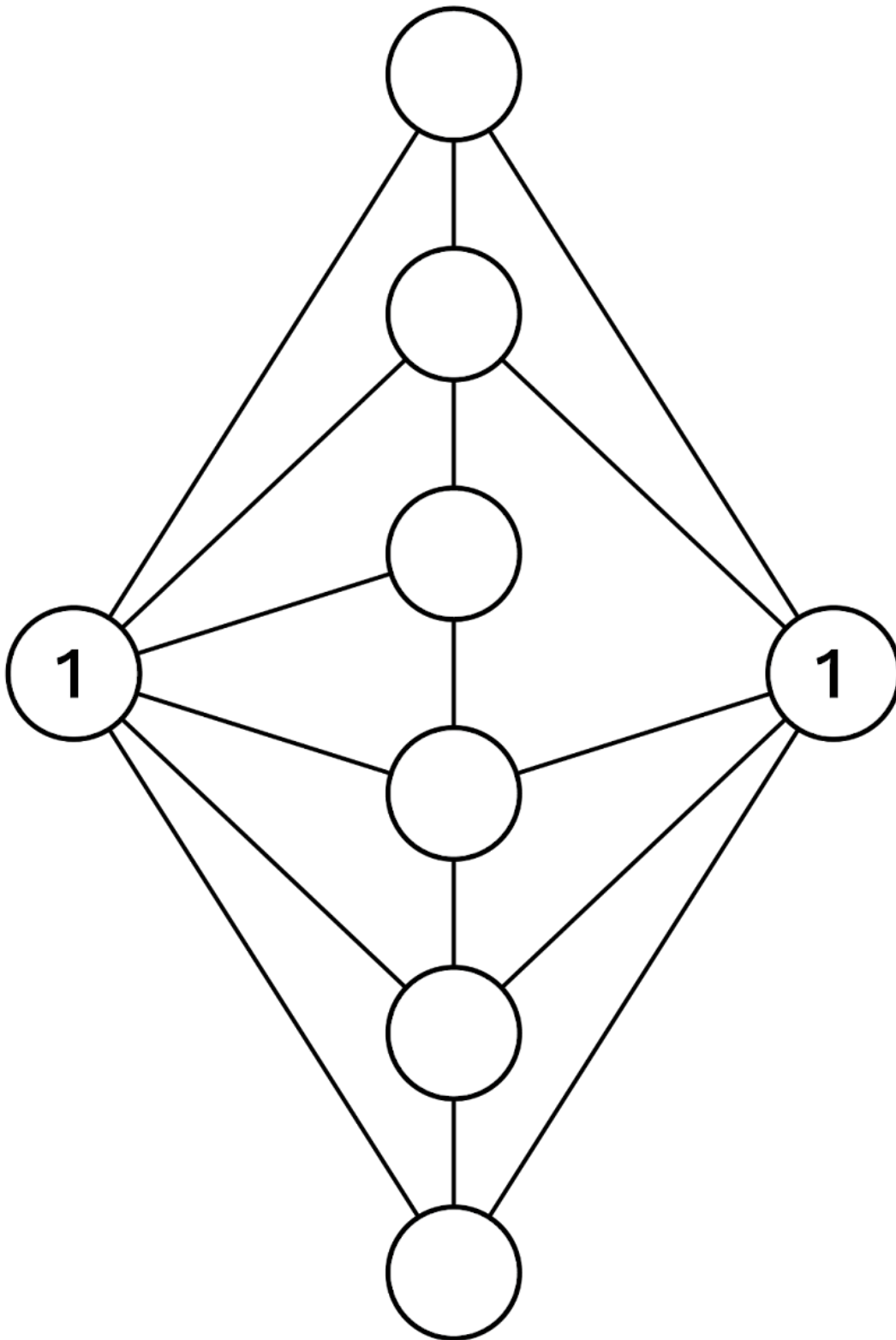
Stepping Stones Tasks

Puzzle 8



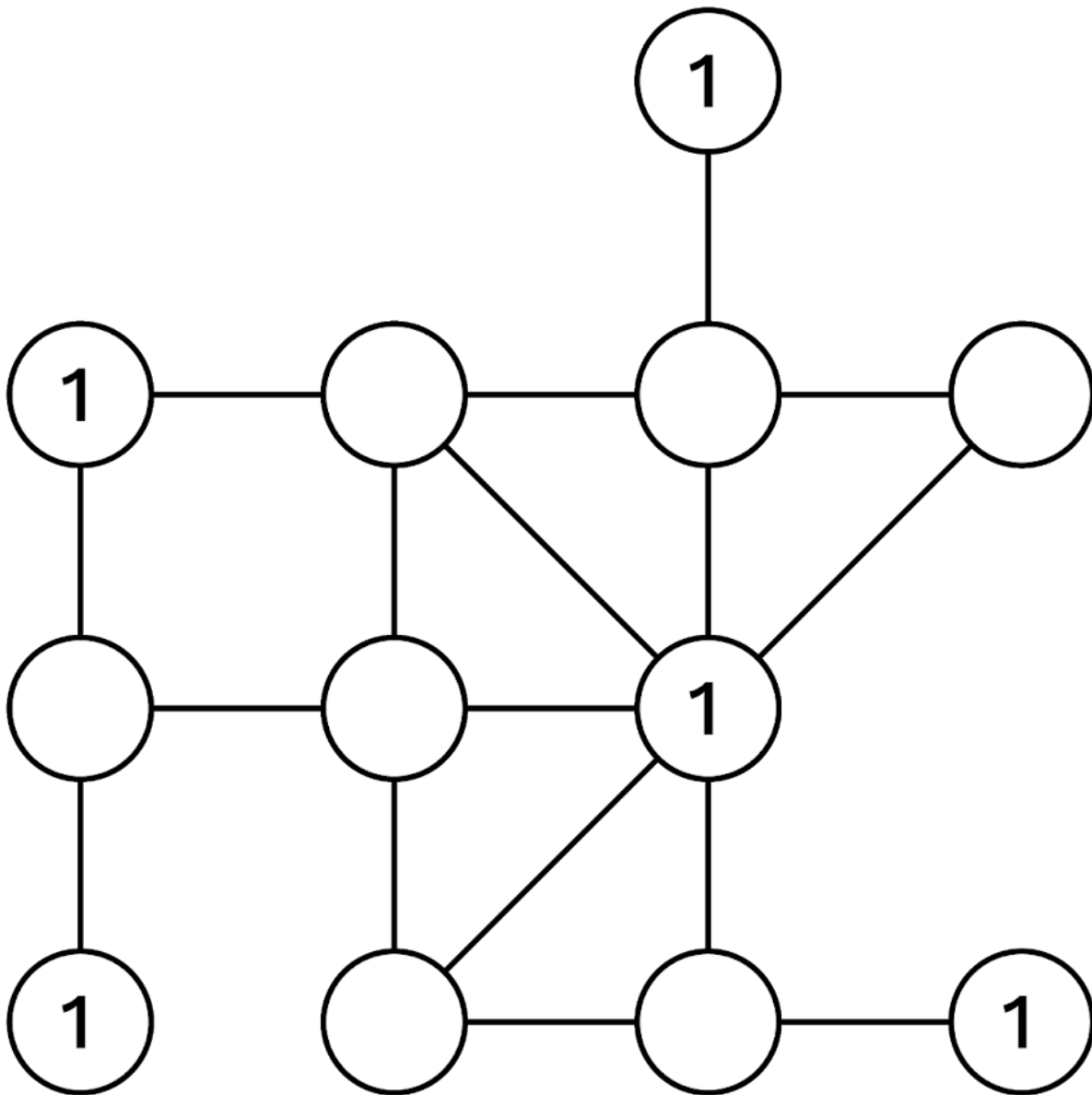
Stepping Stones Tasks

Puzzle 9



Stepping Stones Tasks

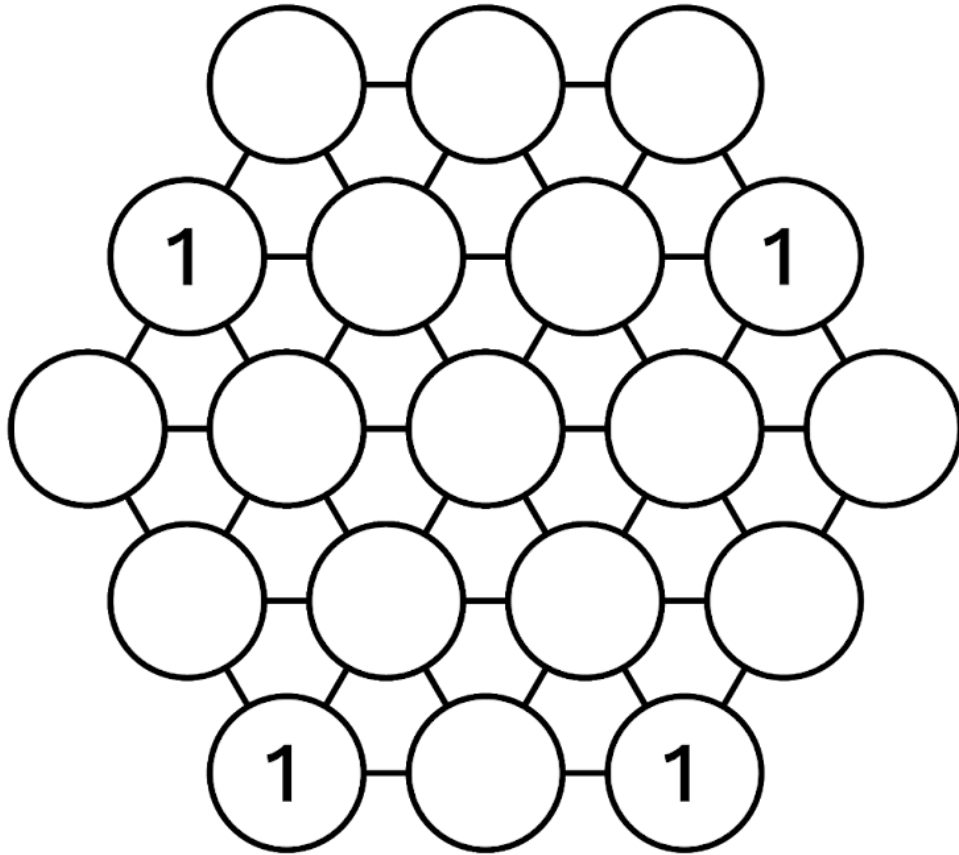
Puzzle 10



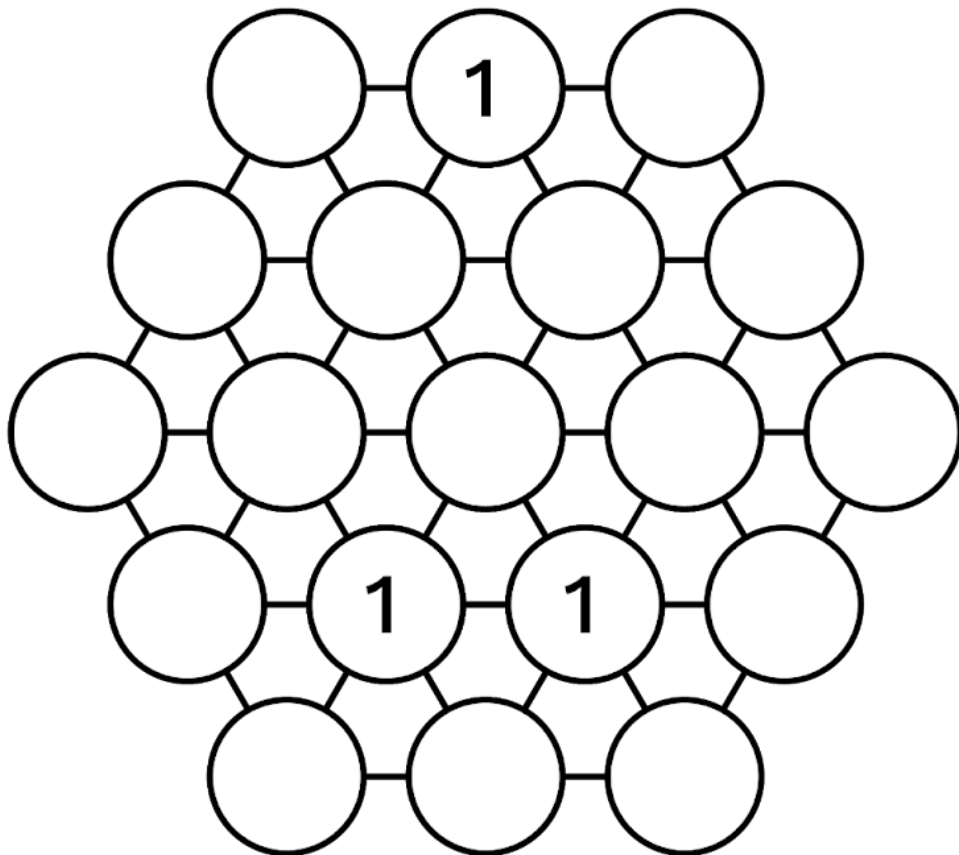
Stepping Stones Tasks

Every empty circle does not need a number.

Puzzle 11: Place 2 through 11

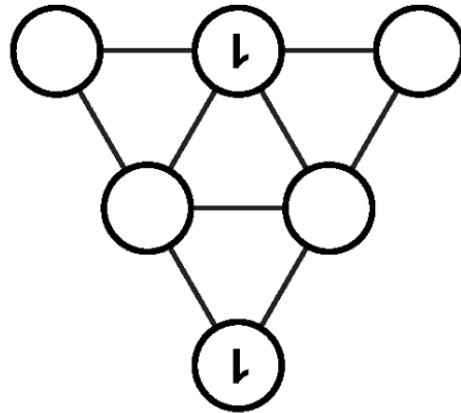


Puzzle 12: Place 2 through 10





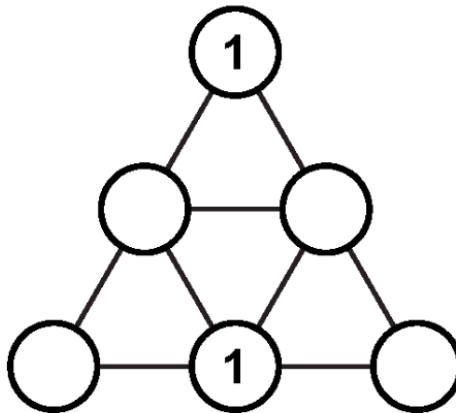
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