

Logic & Reasoning – Puzzles & Games
Assignment

Name: _____

Pattern Problems

Use the following information to answer the next two questions.

Three rows of a pattern are shown below.

Row 1	$1 \times 8 + 1 = 9$
Row 2	$12 \times 8 + 2 = 98$
Row 3	$123 \times 8 + 3 = 987$

- The fifth row of the pattern will be
 - $1\ 234 \times 8 + 4 = 9876$
 - $1\ 234 \times 8 + 5 = 9876$
 - $12\ 345 \times 8 + 4 = 9876$
 - $12\ 345 \times 8 + 5 = 98765$
- If the number 8 in the pattern above is replaced by the number 9 as shown below, describe a pattern that could be used to calculate the value of row 7.

Row 1 $1 \times 9 + 1 =$ _____

Row 2 $12 \times 9 + 2 =$ _____

Row 3 $123 \times 9 + 3 =$ _____

Use the following information to answer the next question.

A student makes the following statement.

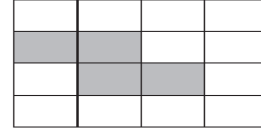
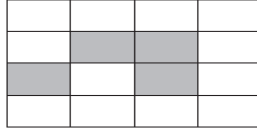
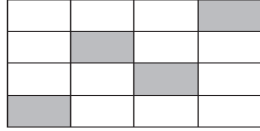
“VOTE compares to VETO as the number 8570 compares to the number _____.”

Numerical Response

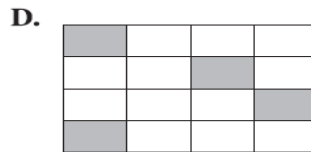
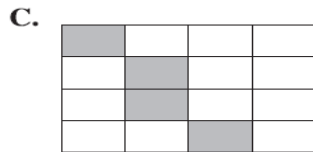
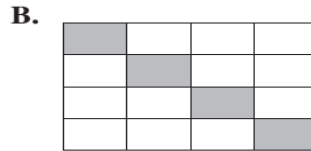
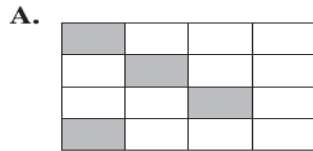
- The 4-digit number that completes the statement above is _____.

Use the following information to answer the next question.

A pattern of pictures is shown below. The first picture is the original. In each subsequent picture, each shaded square has stayed in the same place **or** moved to a square horizontally, vertically, or diagonally adjacent to its previous location. The shaded square undergoes the same movement in each subsequent step.

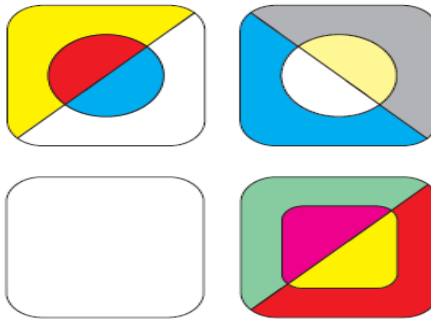


4. Which of the following pictures is next in the pattern?

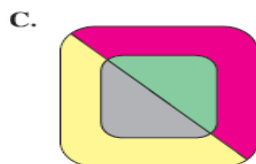
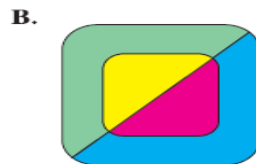
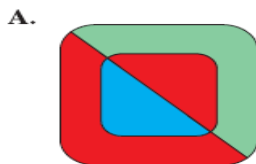


Use the following information to answer the next question.

A geometric pattern is presented below. In this pattern, the lower left square is unknown.



5. Which of the following could be in the lower left square to complete the geometric pattern shown above?



Complete Puzzles

1. Visit the following websites to practice completing puzzles. There are also a few hardcopies in class.

Futoshiki

- www.sudoku-puzzles.net

Sudoku

- www.sudoku-puzzles.net
- <http://www.sudoku-dragon.com/sudokustrategy.htm> (Strategy tips)

Strimko

- www.strimko.com/play.htm

Khan Academy Brain Teasers

- <https://www.khanacademy.org/math/recreational-math/brain-teasers>

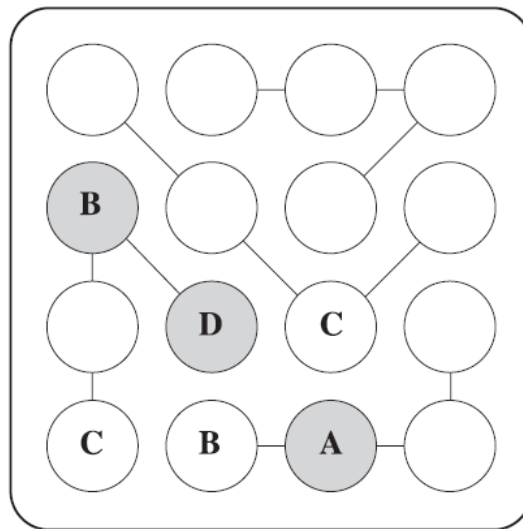
Collection of Various Puzzles

- www.puzzles.com

Use the following information to answer the next question.

The goal of a particular puzzle is to fill the circles in a grid with the letters A, B, C, and D so that no letters are repeated in any row, column, or set of connected circles.

The three entries in the grey circles were given to start the puzzle. Jerome has already completed three entries shown in the white circles, but he has made an error.



2.
 - a. Identify the error that Jerome made in his solution to the puzzle.
 - b. Explain why this entry is incorrect.
 - c. Correct the error that Jerome made and complete the puzzle.

Strategies

1. Visit the following websites to practice game strategy and/or play some offline games.

Connect Four

- <http://www.mathsisfun.com/games/connect4.html>

Set Game

- http://www.setgame.com/set/daily_puzzle

Reversi / Othello

- <http://www.mathsisfun.com/games/reversi.html>

Chess

- www.chess.com

Lightbot

- <http://light-bot.com>

Flow Free

- download the app

Unblock Me

- www.quickflashgames.com/games/unblock

Towers of Hanoi

- <http://illuminations.nctm.org/Lesson.aspx?id=3016>

Cribbage

Collection of Various Math Games

- www.coolmath-games.com

Use the following information to answer the next question.

The intention of a particular two-player game is to create a line of four adjacent squares using the same letter. To play, each player takes turns placing their first initial somewhere on a six-by-six grid. Margaret and Gerda have started playing this game, as shown on the grid below.

		Column					
		1	2	3	4	5	6
Row	1	G					
	2		G				
	3			G	G		
	4			M	M	G	
	5		M				
	6	M	M	G			

Numerical Response

2. It is Margaret's turn, and she determines that she can guarantee a win by placing the letter M in

row _____

column _____

3. Pick a game of your choice and explain any winning strategies. Create a variation of a game and discuss how strategies may change due to the variation.