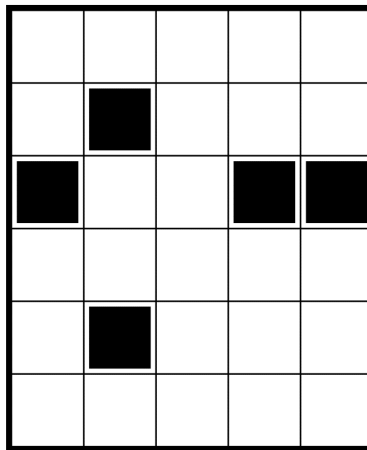




1. Great Divide - 5 points

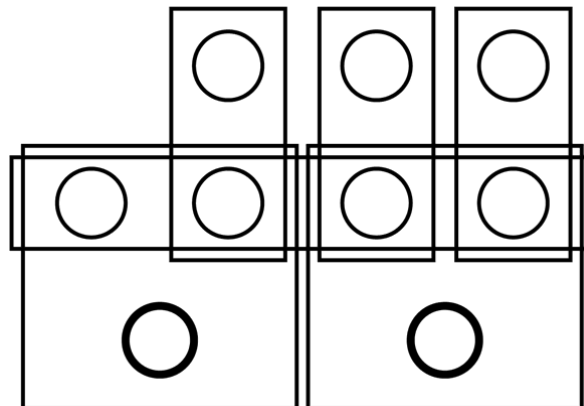
Paint 10 squares black so that the 5x6 unit rectangle below is divided into two pieces: one black and the other white, each with the same size and shape.



Answer: Enter the length (in linear units) of the boundary separating the black and white pieces.

2. Number Boxes - 10 points

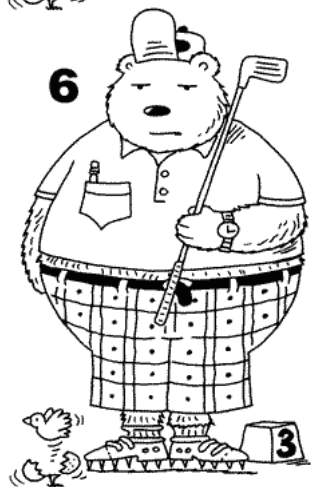
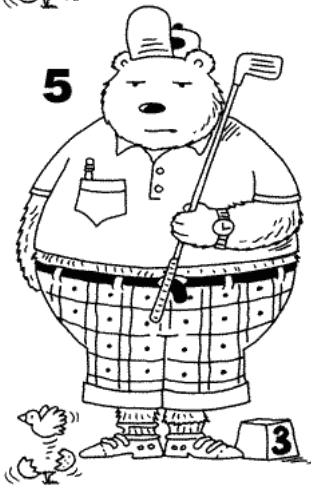
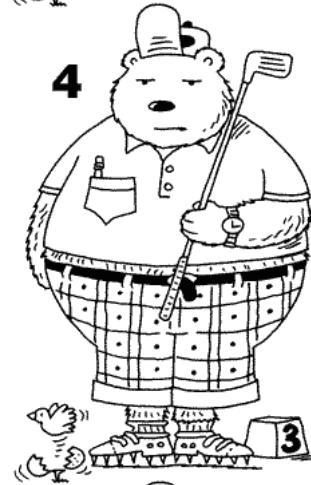
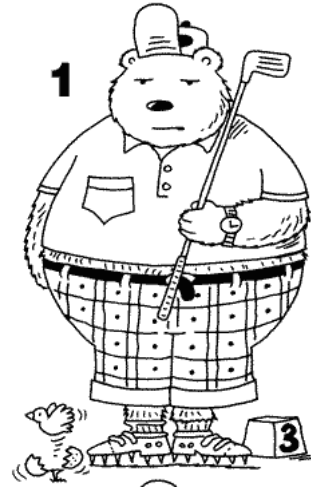
Place the digits 1 through 9 (each used exactly once) into the circles, so that the numbers inside every rectangle have the same sum.



Answer: Enter the digits in the two highlighted circles (in the bottom row).

3. Birdie for the Bear - 5 points

Which of the numbered drawings matches the drawing in the upper left?



Answer: Enter the number of the matching drawing.

4. The Common Touch - 5 points each; 5 point bonus for solving all three

In each of these puzzles, the seven geographical names in the Yes group all share a simple, but unusual property that none of the six names in the No group have. For each puzzle, pick one of the eight names from the Name List at the right that shares the property of the Yes group. (Note: The unusual properties are all word-related, and have nothing to do with the locations themselves; i.e., no knowledge of geography is needed to solve the puzzles.)

| | | Yes | No |
|-----|--|-----------------------|--------------------|
| 4.1 | | Bordeaux, France | Bristol, England |
| | | Glasgow, Scotland | Caracas, Venezuela |
| | | Hangzhou, China | Khartoum, Sudan |
| | | Jericho, Jordan | Omsk, Russia |
| | | Juneau, United States | Perth, Australia |
| | | Montevideo, Uruguay | Seoul, Korea |
| | | Tokyo, Japan | |

| | | Yes | No |
|-----|--|-------------------------|--------------------|
| 4.2 | | El Tigre, Venezuela | Apia, Samoa |
| | | Kaffrine, Senegal | Bujumbura, Burundi |
| | | Nandi, Fiji | Calcutta, India |
| | | Ottawa, Canada | Kingston, Jamaica |
| | | Sincelejo, Colombia | Lilongwe, Malawi |
| | | Villa Sanjurjo, Morocco | Malmö, Sweden |
| | | Yokohama, Japan | |

| | | Yes | No |
|-----|--|-----------------------|-----------------------|
| 4.3 | | Arlon, Belgium | Bulawayo, Zimbabwe |
| | | Borujerd, Iran | Moma, Mozambique |
| | | Burgdorf, Switzerland | Oulu, Finland |
| | | Corumbé, Brazil | Quan Long, Vietnam |
| | | Lvov, Ukraine | Tegucigalpa, Honduras |
| | | Moulins, France | Temuco, Chile |
| | | Tuxtla, Mexico | |

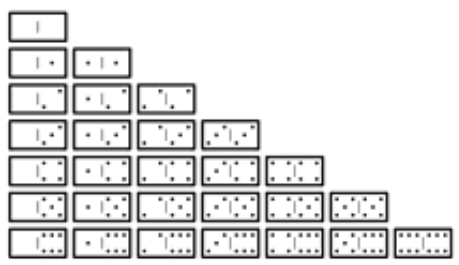
- Name List:**
- A. Alma-Ata, Kazakhstan
 - B. Chinju, Korea
 - C. Ciudad del Este, Paraguay
 - D. Damascus, Syria
 - E. Kérouané, Guinea
 - F. Kuala Lumpur, Malaysia
 - G. Odense, Denmark
 - H. Stowe, United States

Answer: For each problem, enter the letter corresponding to the name that shares the property in the Yes group.

5. Missing Dominoes - 5 points

Twenty-six dominoes in a standard set of 28 dominoes (double-0 through double-6) have been placed in the tray shown below. The domino halves are indicated by digits from 0 to 6, corresponding to the number of pips; but the dominoes' borders are not shown in the tray. Which two dominoes are missing?

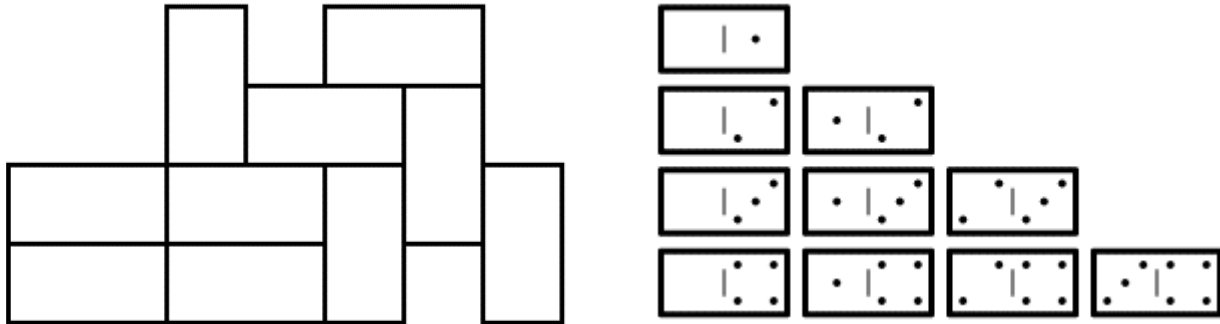
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 3 | 6 | 5 | 2 | 6 | 4 | 0 | 5 | 6 | 2 | 5 | 1 |
| 3 | 0 | 0 | 4 | 1 | 1 | 6 | 1 | 3 | 0 | 0 | 4 | 2 |
| 4 | 6 | 3 | 5 | 4 | 0 | 1 | 1 | 1 | 6 | 2 | 4 | 1 |
| 3 | 6 | 2 | 2 | 4 | 2 | 6 | 4 | 5 | 0 | 3 | 2 | 5 |



Answer: Enter the two dominoes missing from the tray (e.g., 0-0, 6-6)

6. Domino Stacking - 10 points

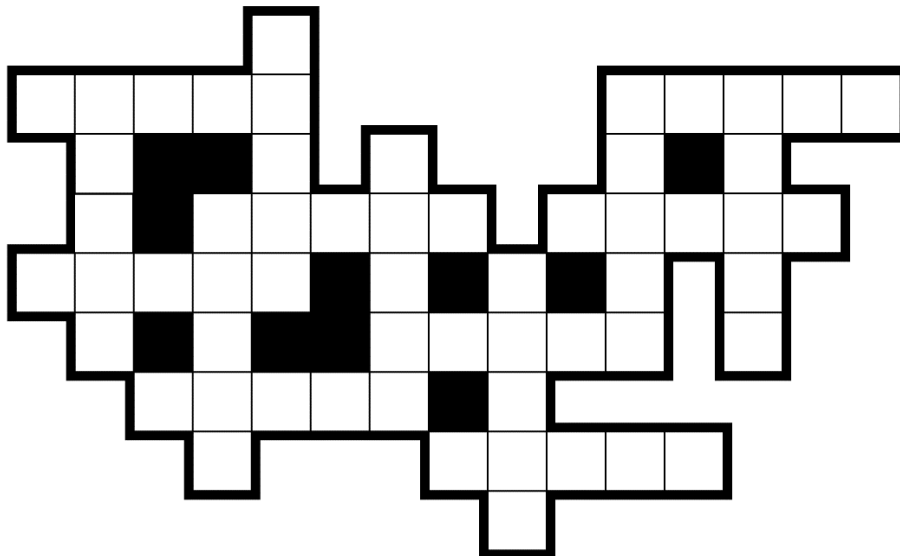
You are given the set of 10 dominoes shown on the right. Replace the domino halves with digits from 0 to 4, corresponding to the number of pips; then place this set into the diagram on the left so that each digit is different from the horizontally adjacent digits (if any) and is larger than the one below it (if any).



Answer: Enter the digits from left to right and top to bottom--first the top row, then the second row, then the third, and finally the bottom row.

7. Crisscross - 10 points

Fifteen of the following Czech animal names can be placed in the grid to complete the crisscross pattern across and down. Which name is left over when you're done? Note: diacritical marks *are* significant. For example, a C with a hacek (Č) can cross another C only if it also has a hacek.

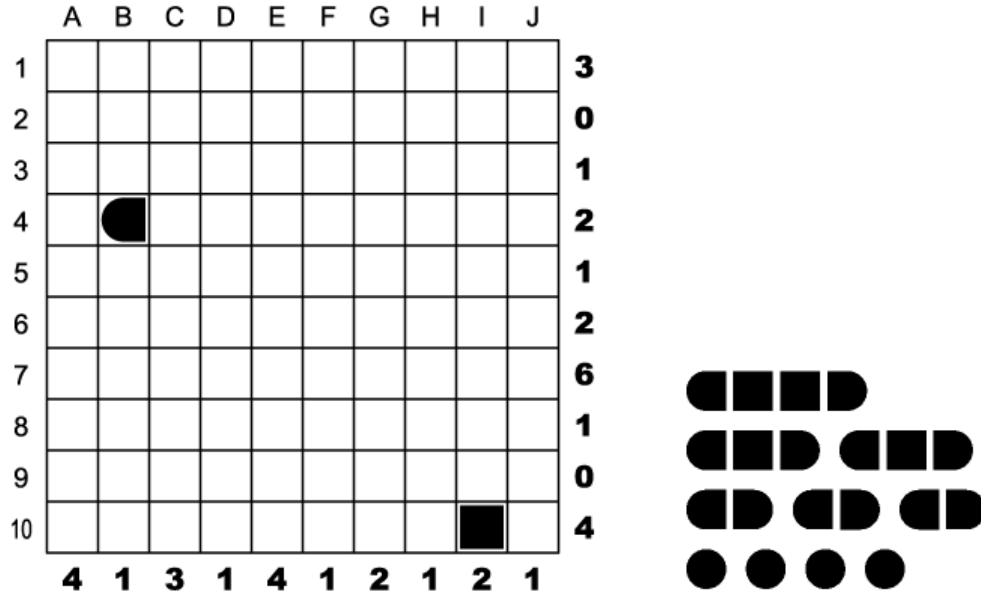


- | | |
|-----------------|--------------------|
| BIZON (bison) | MAKAK (macaque) |
| BŮVOL (buffalo) | MEZEK (mule) |
| GIBON (gibbon) | MORČE (guinea pig) |
| JELEN (deer) | OKAPI (okapi) |
| KOALA (koala) | OPICE (ape) |
| KOČKA (cat) | PAKŮŮ (wildebeest) |
| KRTEK (mole) | PRASE (pig) |
| LEMUR (lemur) | TČHOR (skunk) |

Answer: Enter the missing animal name (do not include diacritical marks, if any).

8. Battleship - 10 points

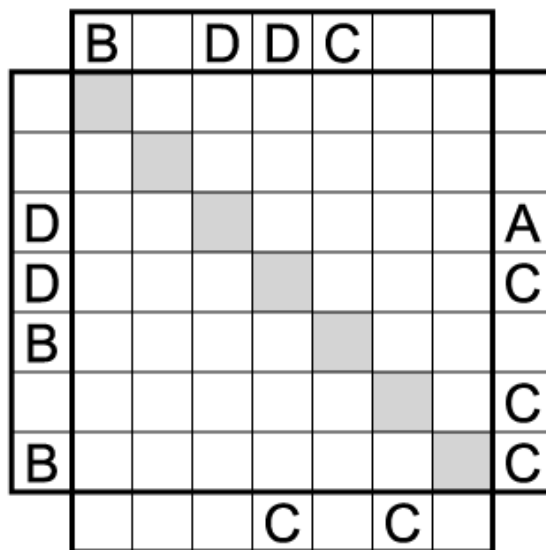
Locate the position of the 10-ship fleet in the grid. The fleet is shown to the right of the grid: one 4-unit battleship, two 3-unit cruisers, three 2-unit destroyers, and four 1-unit submarines. Each segment of a ship occupies a single cell. Ships are oriented either horizontally or vertically, and they do not touch each other, not even diagonally. The numbers on the right and bottom edges of the grid reveal the total number of the ship segments that appear in each respective row or column. (For solving this puzzle, ignore the letters above and the numbers left of the grid.)



Answer: Enter the coordinates (A-1, J-10, etc.) corresponding to the four one-unit submarines.

9. End View - 15 points

Enter the letters A, B, C, and D once in each row and column. The clues outside the grid indicate which letter appears first from that direction. For example, B must be the topmost letter in the left column.



Answer: Enter the contents of the seven squares in the highlighted diagonal, from upper-left to lower-right; using a dash ("-") for squares that are empty.

10. Sum Place - 10 points

If the following are true relationships:

PANAMA + JAPAN = 5

FIJI + CUBA = 7

SWEDEN + NORWAY = 9

AUSTRIA + AUSTRALIA = 7

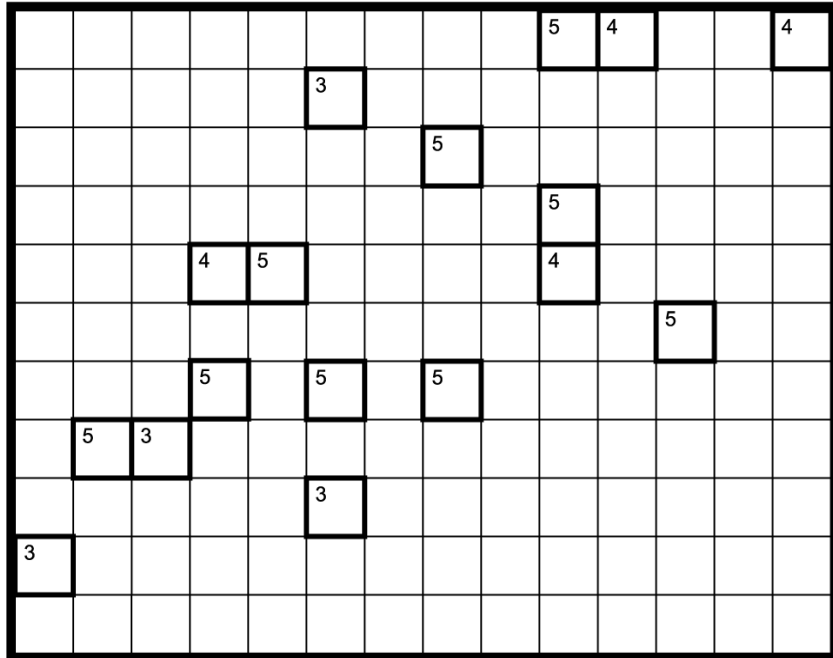
Then what is the corresponding value for:

CANADA + UNITED STATES = ?

Answer: Enter the missing value.

11. Club Sandwich - 20 points

The first and last names of nine professional golfers are to be wedged into the grid below, crisscross-style (that is, words are completely interlocked and go from left to right or top to bottom, and no words of two or more letters not in the list of names are formed in the completed grid). Each first name ("Front 9") *begins* on a numbered square, and each last name ("Back 9") *ends* on a numbered square; the number in the square is the number of letters in the corresponding name.



- | Front 9 | Back 9 |
|----------------|---------------|
| BOB | TWAY |
| JIM | FURYK |
| SAM | SNEAD |
| TOM | KITE |
| MIKE | WEIR |
| DAVID | DUVAL |
| ERNIE | ELS |
| TIGER | WOODS |
| VIJAY | SINGH |

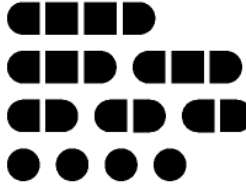
Answer: Enter the letters in the numbered squares from left to right and top to bottom, starting with the first row, then the second row, continuing until the bottom row.

12. Digital Battleship - 10 points

Locate the position of the 10-ship fleet in the grid. The fleet is shown to the right of the grid: one 4-unit battleship, two 3-unit cruisers, three 2-unit destroyers, and four 1-unit submarines. Each segment of a ship occupies a single cell; ships are oriented either horizontally or vertically. Ships do not touch each other, not even diagonally.

In this variation of Battleships, the values on the right and bottom edges of the grid reveal the sum of the numbers in each of the ship segments that appear in each respective row or column.

| | | | | | | | | | | |
|-----------|----------|-----------|----------|----------|----------|----------|----------|-----------|----------|-----------|
| 5 | 5 | 5 | 7 | 5 | 9 | 1 | 7 | 3 | 1 | 1 |
| 9 | 9 | 9 | 9 | 4 | 3 | 3 | 3 | 4 | 2 | 3 |
| 6 | 7 | 8 | 7 | 5 | 5 | 9 | 6 | 6 | 4 | 30 |
| 9 | 2 | 7 | 5 | 9 | 5 | 7 | 7 | 7 | 3 | 9 |
| 6 | 2 | 1 | 5 | 5 | 1 | 1 | 4 | 8 | 6 | 20 |
| 5 | 5 | 5 | 5 | 3 | 1 | 2 | 2 | 8 | 8 | 5 |
| 7 | 6 | 4 | 4 | 8 | 1 | 3 | 3 | 9 | 1 | 15 |
| 2 | 5 | 8 | 1 | 3 | 8 | 1 | 1 | 8 | 2 | 5 |
| 6 | 9 | 4 | 5 | 6 | 3 | 5 | 9 | 4 | 3 | 3 |
| 7 | 5 | 9 | 2 | 8 | 4 | 5 | 1 | 4 | 1 | 4 |
| 15 | 5 | 13 | 7 | 5 | 4 | 8 | 7 | 27 | 4 | |



Answer: Enter the numbers corresponding to the four submarines.

13. Railroad Tracks - 15 points

Lay a single, closed loop of railroad track that travels through each square of the grid exactly once. The track connects squares horizontally or vertically, and crosses itself only at the six crossings ("+") shown in the grid.

The track does not turn as it passes through the stations, which are the squares containing numbers. As you follow the track, visit stations 1 through 5 in order, then return to station 1.

| | | | | | | | |
|--|---|---|---|---|--|---|---|
| | | | | | | | |
| | | | 3 | + | | | |
| | 4 | + | | | | | 1 |
| | + | | | | | + | |
| | | | | + | | | |
| | | | | | | | 2 |
| | | | + | 5 | | | |
| | | | | | | | |

Answer: Enter the number of times you cross a crossing when traveling between stations 1 and 2, then the same for between stations 2 and 3, between 3 and 4, between 4 and 5, and finally for between stations 5 and 1.

14. 50/50 Minesweeper - 10 points

Exactly half of the squares in the diagram below contain a mine. Additionally, exactly half of the numbered squares also contain mines. A number in a square *without* a mine is the correct count of the mines in the horizontally, vertically, and diagonally adjacent squares; a number in a square that does contain a mine is *not* the correct count of the mines in adjacent squares. Where are the mines?

| | | | | | |
|---|---|---|---|---|---|
| 3 | | | 0 | | |
| | | | | | 5 |
| 4 | | | | | |
| | 8 | 2 | | | 6 |
| | 1 | | 9 | 7 | |
| | | | | | |

Answer: Of the 10 numbered squares, enter the numbers in the five squares that do not contain mines.

15. Alice Maze - 25 points

Alice starts chasing rabbits at the upper left corner ("S") of the maze. Her goal is the rabbit hole in the lower-right corner ("F"). She begins moving one unit at a time, in a straight line either horizontally or vertically, but only in the direction of the arrow(s) in the current square. When she lands on a square with a "+"-pill, the distance of all future moves is increased by one unit; when she lands on a square with a "-"-pill, the distance of all future moves is decreased by one unit. Alice cannot move past the edge of the maze. (For solving this puzzle, ignore the letters and numbers inside each square.)

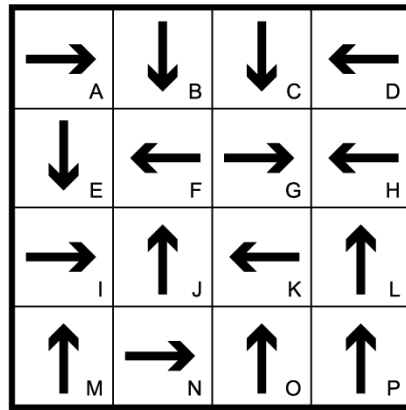
As an example, here is a poor way to start the maze: move one square down, one square right, then one square down. Alice landed on a square with a "-"-pill. All future moves are of length zero, which means she's stuck.

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Answer: Enter the letter/digit in the square for each move, starting with "S" in the upper-left, and ending with "F" in the lower-right.

16. Loop-D-Loop - 15 points

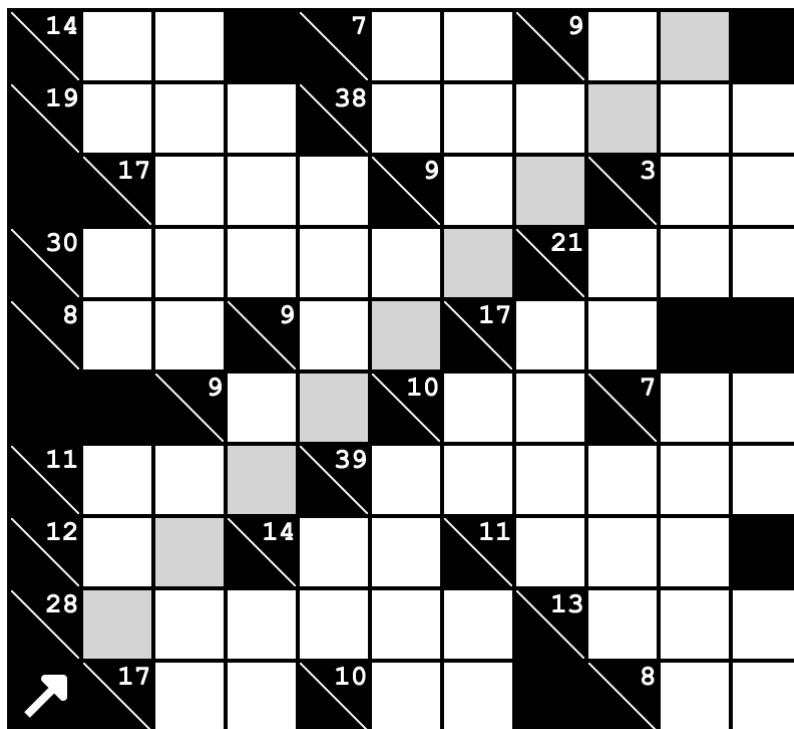
Trace a path from the upper left square back to itself, jumping to each of the other squares exactly once. Each jump can be any distance, but must be in the direction indicated in the current square. (For solving this puzzle, ignore the letters inside each square.)



Answer: Enter the letter in each square visited in order, starting and ending with "A".

17. Cross Sums Variation - 20 points

This is a standard Cross Sums puzzle, a crossword made with numbers instead of words, but with one exception. Enter a single digit from 1 to 9 into each empty square so that the sum of the digits in each Across answer equals the value given to the left. *The sum for each Down answer is always 15.* No digit is repeated within a single answer.



Answer: Enter the 9 digits in the diagonal indicated by the arrow, starting in the lower-left corner of the grid.

18. Bad Math - 15 points

In the following long division problem, change each of the digits to a different digit so that the arithmetic is correct. Note that there is no remainder, and that numbers do not start with leading zeros.

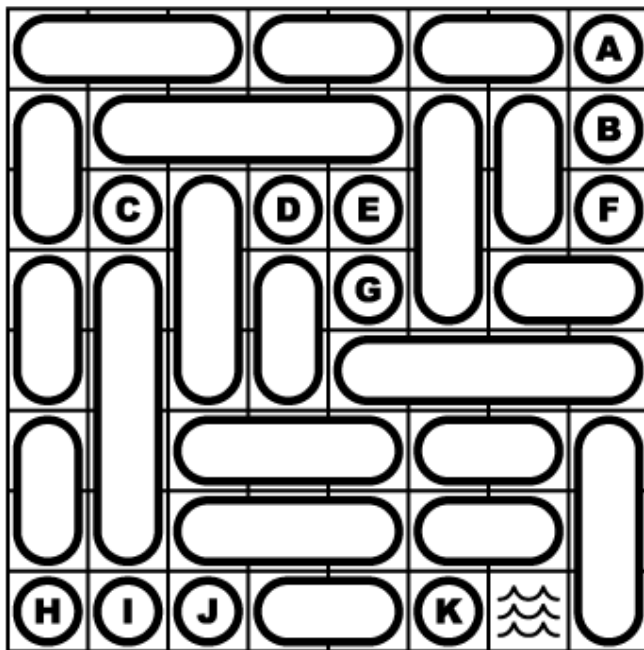
$$\begin{array}{r}
 4321 \\
 15 \overline{)95867} \\
 \underline{42} \\
 365 \\
 \underline{12} \\
 72 \\
 \underline{69}
 \end{array}$$

Answer: Enter the dividend, divisor and quotient in the form: XXXXX / XX = XXXX.

19. Retrograde Battleship - 15 points

Locate the position of the 10-ship fleet in the grid. The fleet is shown to the right of the grid: one 4-unit battleship, two 3-unit cruisers, three 2-unit destroyers, and four 1-unit submarines. Each segment of a ship occupies a single cell. Ships are oriented either horizontally or vertically, and they do not touch each other, not even diagonally.

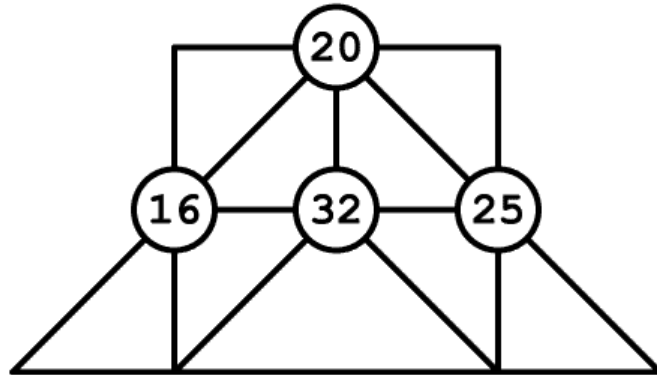
In this variation, the possible placements of the ships are given; the puzzle is to find the correct subset. (For solving this puzzle, ignore the letters inside the grid.)



Answer: Enter the four letters corresponding to the four one-unit submarines.

20. Have Sum Fun! - 15 points

Place a different digit from 1 to 9 inside each of the nine triangles so that each of the four circled numbers is the sum of the digits in the triangles that touch it.



Answer: Enter the four digits on top from left to right, followed by the five digits on bottom from left to right.

21. Arrowheading - 15 points

In this maze, your course headings are predetermined and point values have been assigned to each passage. Starting from the bottom intersection, travel to each of the other five intersections and return to the beginning intersection with the *lowest* possible total score (the sum of the values for each passage used).



Answer: Enter your total score.

22. High Five - 10 points

You have a set of five numbers. When adding together each of the ten possible pairs, you get the following sums:

0, 6, 11, 12, 17, 20, 23, 26, 32, 37.

What are the five original numbers?

Answer: Enter the five numbers.

23. Meandering River - 30 points

The names of 25 world rivers can be found in the word search grid. Each name reads in a straight line horizontally, vertically, or diagonally. The 30 empty spaces in the grid must be filled in before the puzzle can be completed.

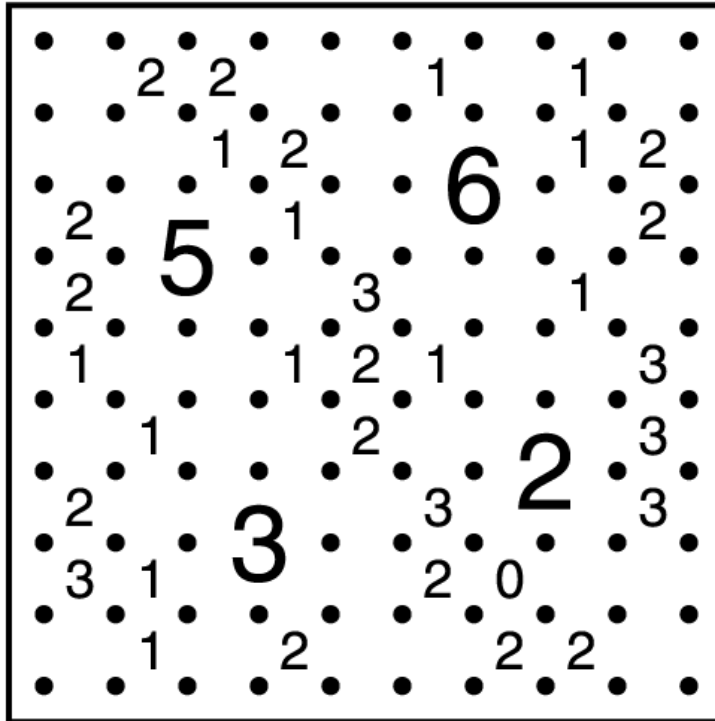


- | | |
|----------------------------------|-------------------------|
| CROCODILE (South Africa) | NIGER (Mali/Nigeria) |
| DEVON (Scotland) | ORONTES (Syria) |
| DNIEPER (Russia/Belarus/Ukraine) | PECHORA (Russia) |
| DNIESTER (Ukraine/Moldova) | SEINE (France) |
| DVINA (Russia/Belarus/Latvia) | SEMLIKI (Zaire/Uganda) |
| FEATHER (USA) | SHANNON (Ireland) |
| GEORGINA (Australia) | ST. CLAIR (USA) |
| ILLINOIS (USA) | ST. LAWRENCE (Canada) |
| INDUS (Pakistan) | TENNESSEE (USA) |
| IRTYSH (Kazakhstan/Russia) | TIGRIS (Iraq) |
| KENNET (England) | VLTAVA (Czech Republic) |
| MEKONG (Thailand/Laos/Vietnam) | YUKON (Canada/USA) |
| NELSON (Canada) | |

Answer: List the 30 missing letters in the order of the meandering river, starting in the upper left and winding down to the bottom right.

24. Fences Variation - 30 points

Draw a single continuous loop by connecting neighboring dots horizontally or vertically (but not diagonally). A numbered square indicates exactly how many of its four, or eight, edges are used by the path.



Answer: Enter the number of digits inside the loop.

END OF TEST
