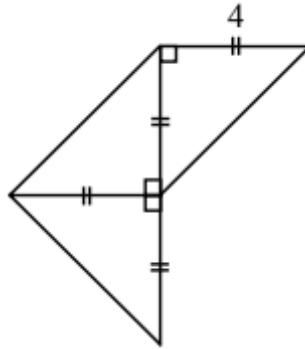


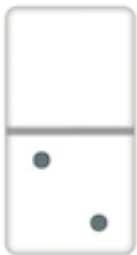
1. The area of the entire figure shown is...



2. The product of two whole numbers is 24. The smallest possible sum of these two numbers is...



3. A prime number is called a “Superprime” if doubling it, and then subtracting 1, results in another prime number. The number of Superprimes less than 15 is...



4. Rectangular tiles, which measure 6 by 4, are arranged without overlapping, to create a square. The minimum number of these tiles needed to make a square is...



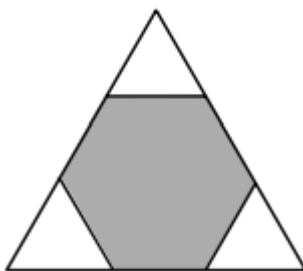
5. Anne, Beth and Chris have 10 candies to divide amongst themselves. Anne gets at least 3 candies, while Beth and Chris each get at least 2. If Chris gets at most 3, the number of candies that Beth could get is...



6. Naoki wrote nine tests, each out of 100. His average on these nine tests is 68%. If his lowest mark is omitted, what is his highest possible resulting average?



7. A regular hexagon is inscribed in an equilateral triangle, as shown. If the hexagon has an area of 12, the area of the large triangle is...

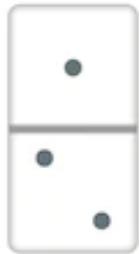


8. Catrina runs 100 m in 10 seconds. Sedra runs 400 m in 44 seconds. Maintaining these constant speeds, they participate in a 1 km race. How far ahead, to the nearest metre, is the winner as she crosses the finish line?





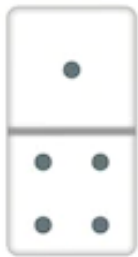
9. Enzo has fish in two aquariums. In one aquarium, the ratio of the number of guppies to the number of goldfish is 2:3. In the other, this ratio is 3:5. If Enzo has 20 guppies in total, the least number of goldfish that he could have is...



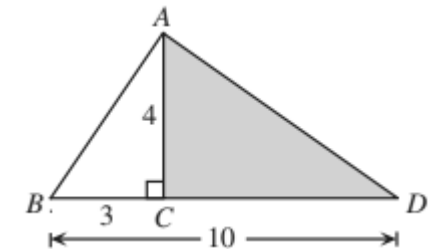
10. Four friends equally shared  $\frac{3}{4}$  of a pizza, which was left over after a party. What fraction of a whole pizza did each friend get?



11. A palindrome is a positive integer whose digits are the same when read forwards or backwards. For example, 2002 is a palindrome. What is the smallest number which can be added to 2002 to produce a larger palindrome?

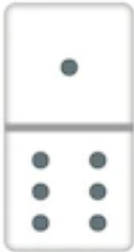


12. In the diagram,  $AC = 4$ ,  $BC = 3$ , and  $BD = 10$ . The area of the shaded triangle is...





13. In the following equations, the letters a, b and c represent different numbers. The numerical value of  $a + b + c$  is...



$$1^3 = 1$$

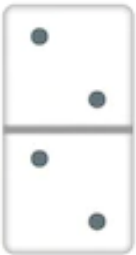
$$a^3 = 1 + 7$$

$$3^3 = 1 + 7 + b$$

$$4^3 = 1 + 7 + c$$

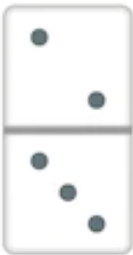
14. A  $3 \times 3$  square frame is placed on a grid of numbers, as shown. In the example, the sum of the numbers inside the square frame is 108, and the middle number is 12. When the square frame is moved to a new position, the sum of its numbers becomes 279. In the frame's new position, what is the middle number?

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49



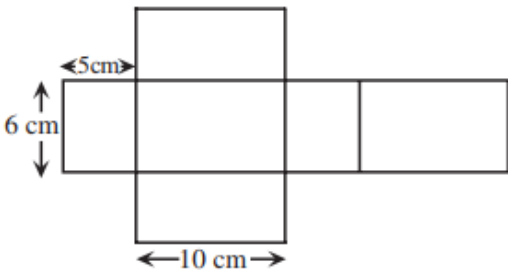
15. A perfect number is an integer that is equal to the sum of all of its positive divisors, except itself. For example, 28 is a perfect number because  $28 = 1 + 2 + 4 + 7 + 14$ . Find all of the perfect numbers less than 30.

16. Five people are in a room for a meeting. When the meeting ends, each person shakes hands with each of the other people in the room exactly once. The total number of handshakes that occurs is...

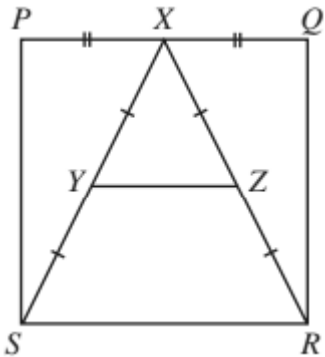




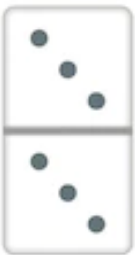
17. The figure shown can be folded along the lines to form a rectangular prism. The surface area of the rectangular prism, in  $cm^2$ , is...



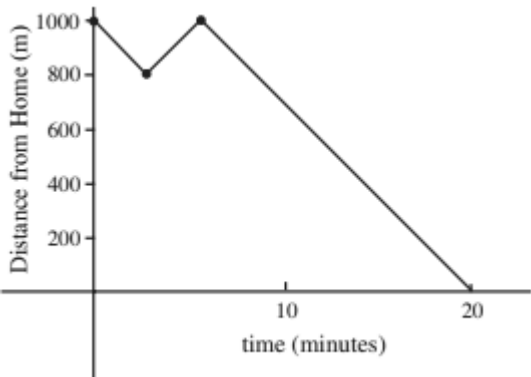
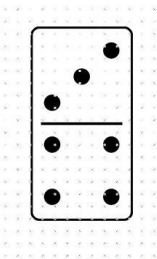
18. PQRS is a square with side length 8. X is the midpoint of side PQ, and Y and Z are the midpoints of XS and XR, respectively, as shown. The area of trapezoid YZRS is...



19. Each of the integers 226 and 318 have digits whose product is 24. How many three-digit positive integers have digits whose product is 24?



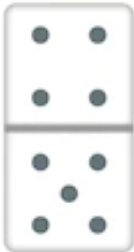
20. Spencer was walking home from school when he realized he had forgotten his homework. He walked back to the school, picked up his homework and then walked home. The graph shows his distance from home at different times. In total, how far did he walk?



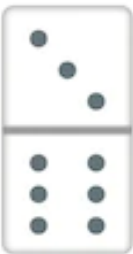
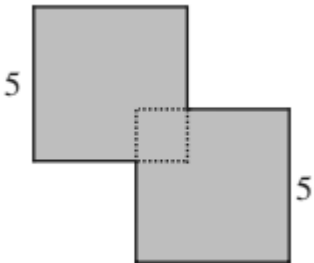




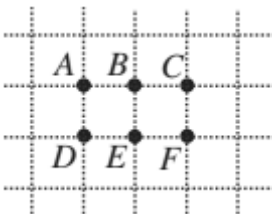
21. The perimeter of a rectangular field is 3 times its length. If the perimeter is 240 m, the width of the field is...



22. Two squares, each with side length 5 cm, overlap as shown. The shape of their overlap is a square, which has an area of  $4\text{ cm}^2$ . What is the perimeter, in centimetres, of the shaded figure?



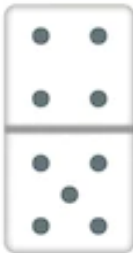
23. Six points A, B, C, D, E, and F are placed on a square grid, as shown. How many triangles that are not right-angled can be drawn by using 3 of these 6 points as vertices?



24. A different letter is painted on each face of a cube. This cube is shown below in 3 different positions:

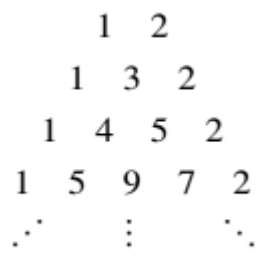


What letter belongs on the shaded face of this cube in the following diagram?

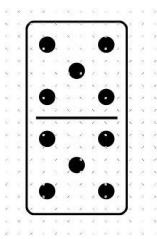




25. In the pattern of numbers shown, every row begins with a 1 and ends with a 2. Each of the numbers, not on the end of a row, is the sum of the two numbers located immediately above and to the right, and immediately above and to the left. For example, in the fourth row the 9 is the sum of the 4 and the 5 in the third row. If this pattern continues, the sum of all of the numbers in the thirteenth row is...

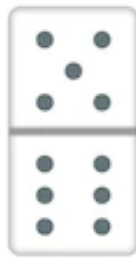



26. In the diagram, all rows, columns and diagonals have the same sum. What is the value of x?



14	19	
	15	
x	11	

27. The entire contents of a jug can exactly fill 9 small glasses and 4 large glasses of juice. The entire contents of the jug could instead fill 6 small glasses and 6 large glasses. If the entire contents of the jug is used to fill only large glasses, the maximum number of large glasses that can be filled is...



28. A grid with 10 rows and some number of columns is made up of unit squares, as shown. A domino (  ) can be placed horizontally or vertically to exactly cover two unit squares. There are 2004 positions in which the domino could be placed. The number of columns in the grid is...

