1. Solve $\sqrt{x+\sqrt{x+\sqrt{x+\ldots}}} = 2$.

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2. What is the maximum number of parts that can be obtained from cutting a circular disc using 3 straight cuts?

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3. Find the next term of the following sequence: 2, 1, 3, 4, 7, …

4. Solve for x and y in the following equation $(x+7)^2 + \sqrt{y-8} = 0$.

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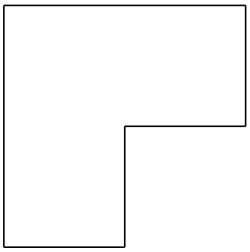
5. Divide the following shape into 4 identical parts.



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6. A perfect number is a positive integer that is equal to the sum of its proper positive factors. Proper positive factors of a number are positive factors that are less than the number. For example, 6 = 1 + 2 + 3 is a perfect number because 1, 2 and 3 are the only proper positive factors of 6. Find the next perfect number.

7. If a and b are positive whole numbers such that $a < b$ and $a^b = b^a$, find a possible value for a and for b.

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8. Find the value of $\dfrac{1}{1+2\left(\dfrac{1}{1+2\left(\frac{1}{1+\ldots}\right)}\right)}$.

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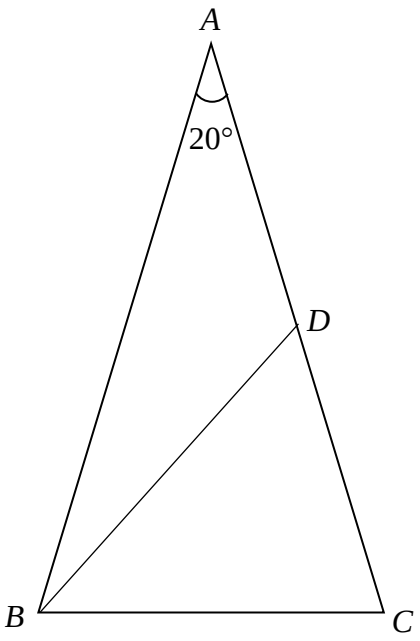
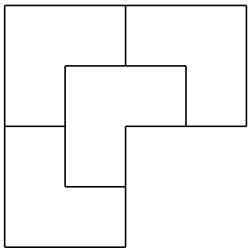
9. What are the last 5 digits of the sum $1 + 11 + 111 + \ldots + \underbrace{111\ldots111}_{2014 \text{ digits}}$?

10. The diagram shows a triangle ABC where $AB = AC$, $BC = AD$ and $\angle BAC = 20°$. Find $\angle ADB$.



End of paper

Solutions	
1.	x = 2
2.	7
3.	11
4.	X=-7, y=8
5.	
6.	28
7.	a=2, b=4
8.	$\frac{1}{2}$
9.	34344
10.	150°