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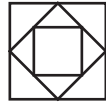
1. Let $x = (1.1)^2 + (0.1)^2$. Express x as a decimal. 1. _____

2. The volume of a cone is 9 cm^3 . What is the volume of a cylinder which has the same base and the same height as the cone? 2. _____ cm^3

3. Suppose that $x > 0$ and $\frac{10}{x} + \frac{40}{x} = x$. What is the *integer* which is nearest to x ? 3. _____

4. The price of A is \$2.60. The price of B is 25% of the price of A. The price of C is $\frac{16}{13}$ times the price of B. What is the price of C? Express your answer in cents. 4. _____ cents

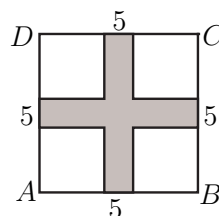
5. Suppose that $1 + 2 + 3 + 4 + N + 6 + 7 + 8 + 9 = 20$. What is the value of N ? 5. _____

6. The figure below consists of three squares with the same centre. The middle-sized square is inscribed diagonally in the large square, and the small square is inscribed diagonally in the middle-sized square. The diagonal of the smallest square has length 5 cm. What is the area of the largest square? 6. _____ cm^2


7. Two fair dice are tossed. What is the probability that the sum is 8? Express your answer as a common fraction. 7. _____

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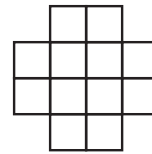
8. Let \mathcal{S} be the 6-element set $\{A, B, C, D, E, F\}$. How many of the subsets of \mathcal{S} have exactly 2 elements? 8. _____
9. On a trip, Alicia drove at 50 km per hour for 30 minutes, then at 80 km/hr for 1 hour, and then at 100 km/hr for 1 hour. What was her average speed for the trip, in km/hr? 9. _____ km/hr
10. What is the area of the convex quadrilateral whose vertices are at $(0, 0)$, $(0, 2)$, $(10, 4)$, and $(10, 0)$? 10. _____ units²
11. What is the smallest integer which is greater than 300 and has exactly four different prime factors? 11. _____
12. Alicia chooses at random a multiple of 6 between 1 and 121. Beth chooses at random a multiple of 15 between 1 and 121. What is the probability that they choose the same number? Express your answer as a common fraction. 12. _____
13. A small cup of coffee costs \$1.50, a medium cup costs \$2.00, and a large cup costs \$2.50. Last month, Sabrina spent a total of \$100.00 on cups of coffee. Of the cups of coffee she bought, 20 were small, 20 were medium, and the rest were large. What is the total number of cups of coffee that Sabrina bought last month? 13. _____ cups
14. Four equal squares are removed from the corners of square $ABCD$, leaving the shaded cross below. The arms of the cross have width 5 units. If the area of the cross is 375 units², what is the area of the square $ABCD$? 14. _____ units²



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15. What is the sum of the solutions of the equation $|1 + x| + |1 - x| = 4$? 15. _____

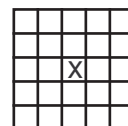
16. The figure below is constructed from 1 by 1 squares. What is the total number of squares (of all sizes) in the figure? 16. _____ squares



17. How many positive integers divide 120 but do not divide 24? Note that for any positive integer n , 1 divides n and n divides n . 17. _____

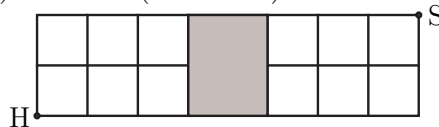
18. How many degrees are there in the acute angle between the hour hand and the minute hand of an ordinary clock at 12:12 PM? 18. _____ degrees

19. The picture below is a *top view* of a big solid cube that has been put together from 125 little cubes, each of side 1 cm. The centre little cube of each face of the big cube is removed. (The little cube removed from the top face has been marked with an x.) What is the total surface area of the solid thus created? 19. _____ cm^2



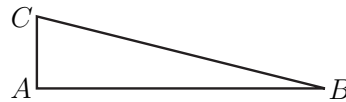
20. How many digits are there in the decimal representation of 5^{40} ? 20. _____ digits

21. The lines in the figure below represent the streets of a village. The shaded region is a park with no road through it. In how many different ways can Alicia drive from home (H) to school (S), if she can never be driving South (downward) or West (leftward)?



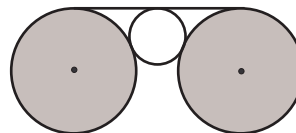
22. Alphonse, Beth, and their mother Gamay were all born in January. In February 2008, their ages were all prime numbers: 11, 13, and 43. What is the first calendar year after 2008 that their ages in February will all be prime?

23. The picture shows a triangle ABC , with $AB = 4$, $AC = 1$, and a right angle at A . So $\triangle ABC$ has area 2. How many points P are there, in the plane of $\triangle ABC$, such that (i) $\triangle ABP$ has area 2, and (ii) $\triangle ABP$ has a right angle somewhere, not necessarily at A . Include in your count the point C of the picture.



24. What is the smallest possible positive value of $9 - \frac{2008}{N}$, if N is a positive integer? Express your answer as a common fraction.

25. The two large shaded circles each have radius 1, and the distance between their centres is $5/2$. The large circles and the small circle are tangent to the same line, and are on the same side of that line. The small circle lies between the two large circles and is tangent to them. What is the radius of the small circle? Express your answer as a common fraction.



26. You have a Magic Money Machine (MMM). Whenever you put in a penny, the MMM keeps the penny, but spits out either 5 or 8 pennies. So if you have only 1 penny, and use the MMM twice, you may end up with 9, 12, or 15 pennies. What is the largest number of pennies that it is *impossible* to end up with, if you have only 1 penny and are allowed to use the MMM as many times as you want?