Mathlete Training Centre
HUA XIA CUP PRELIMINARY ROUND 2023 PRIMARY 6

1. 15 workers share a bonus. Each worker can get 1440 dollars. If 9 more workers share the bonus, how much less will each worker get?

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2. Find the value of $\frac{61\times45+33}{20\times23+3}$.

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3. $A^3 = 12167$. Find the value of A.

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4. Refer to the figure, BD= 7cm. CD= 11cm. The area of triangle ABD is 42 square centimetres. How many squared centimetres is the area of triangle ACD?

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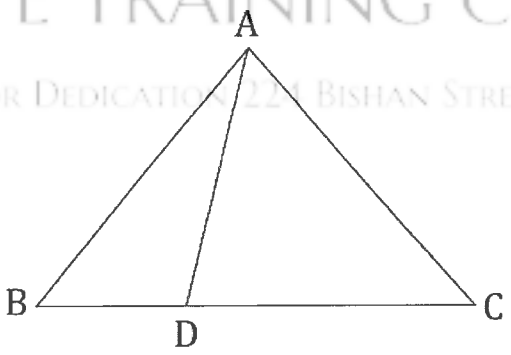

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5. It takes Hua 24 hours to enter a pile of data. For the same job, Xia needs 40 hours to finish. How many hours does it take for Hua and Xia to enter the whole pile of data together?

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6. Xia is A years old now. His average score is B in this term. His rank is C in his grade. If A, B, C are natural numbers, $6 \leq A \leq 12$, $60 \leq B \leq 100$, $1 \leq C \leq 30$, and the product of A, B, C is 22100, what is the sum of A, B, C?

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7. There is a bottle of 23 grams of salt solution with a concentration of 20%. There is another bottle of 57.5 grams salt solution with a concentration of 34%. If two bottles of salt solution are mixed, the product wil be a concentration of x%. Find the value of x.

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8. Find the highest common factor of 8177 and 9361.

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9. Find the value of n if $\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}+\frac{1}{42}=1-\frac{1}{n}$.

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10. Refer to the figure, $AC : DB = 3:5$. $CD : AB = 1:3$. If the length of AD is 2023 centimetres, what is the length of CB in centimetres?

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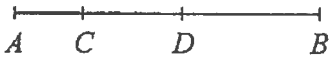

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Section B (Q11 - Q20) Each question is worth 7 marks

11. Hua and Xia walk from point A to point B at the same time. 21 minutes later, Hua reaches point B and turns back immediately. Then he meets Xia at the position 144 metres apart from point B. If Hua walks 12 metres more than Xia per minute, how many metres is the distance between point A and point B?

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12. A cuboid is formed from 20 cubes and the length of the edge is 3 centimetres. At least how large is its surface area in square centimetres?

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13. Hua, Xia and Bei make a batch of machine parts. For every 5 parts Hua makes, Xia makes 3. For every 4 parts Bei makes, Hua makes 3. In total, they make 528 parts together. How many more parts did Bei made than Xia?

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14. The average marks Bei got in the first 4 tests is 75. If he can get 95 marks on every test afterwards, how many more tests does he need to take so that his average marks will be 90 or above?

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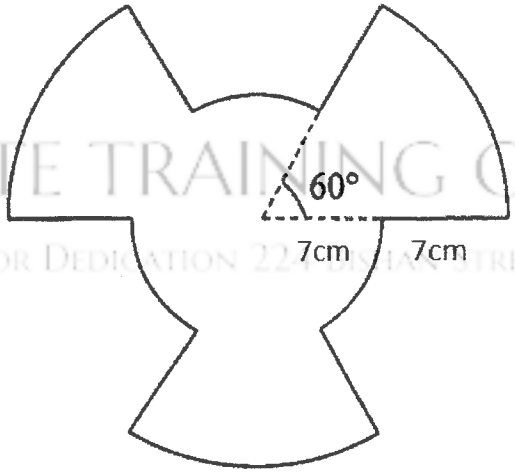
15. Refer to the figure, two sets of (a total of 6) arcs lie on 2 concentric circles. the radii are 14 and 7 centimetres respectively. All the angles at the centre are 60°. What is the perimeter of the figure in centimetres?



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16. In a farm, there is a lawn where cows eat grass. The grass grows at a constant rate. If there are 9 cows, all the grass will be eaten in 12 days. If there are 10 cows, all the grass will be eaten in 8 days. How many days will all the grass be eaten if there are 13 cows?

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17. Find the value of x if:

$$20x + 23y = -11$$
$$3y - 5x = -146$$

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18. There is a cubic tank with an inner edge of 10 centimetres. The tank is filled with some blue paint with a depth of 3 centimetres. A cubic wooden block with an edge length of 5 centimetres is submerged into the paint gently. Then it is carefully taken out. How large is the painted part on the wooden block in square centimetres?

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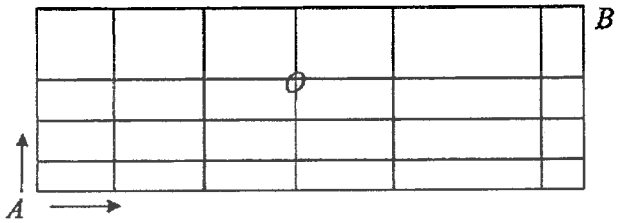
19. Refer to the figure, Hua is walking from point A to point B. He can only move to the right or up for each step. He cannot pass through point O. How many different paths can Hua take?



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20. If integer $n > 2$, and the sum of n consecutive positive integers is 2023, find the least possible value of n.

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