International SoM Contest 2026 Grade Five Solutions

1) **A** Relocate and calculate: $3 \div 15 \times 15 = 3 \times 15 \div 15$
$= 3 \times 1$
$= 3$

2) **A** If each student gets four slices of pizza, then $11 \times 4 = 44$ slices are taken, leaving $54 - 44 = 10$ slices of pizza left over.

3) **C** The LCM of 7 and 8 is 56. Convert each fraction to its equivalent with a denominator of 56, and compare the numerators. The fraction $\frac{4}{7}$ is equivalent to $\frac{32}{56}$, and the fraction $\frac{5}{8}$ is equivalent to $\frac{35}{56}$. Since 32 is smaller than 35, $\frac{4}{7}$ is less than $\frac{5}{8}$.

4) **C** Since -1 is raised to the power of 10, and 10 is an even number, the value of the expression $(-1)^{10}$ is 1. Therefore $(-1)^{10} - 1 = 0$.

5) **B** Since there are only two repeating digits, the 5 will appear in every odd decimal place and the 4 will appear in every even decimal place. Since 54 is even, the 54^{th} digit in the decimal expansion is 4.

6) **A** The pie graph indicates that 33% of the students surveyed chose soccer. This is approximately one-third of the total number of students because one-third is equivalent to $33\frac{1}{3}$ %.

7) **A** The first number in the sequence is multiplied by 1 to get the second number. The second number is multiplied by 2 to get the third number. The third number is multiplied by 3 to get the fourth number, and so on. Following the pattern in the sequence, the fifth number should be multiplied by 5 to get the sixth number. The sixth number in the sequence is $12 \times 5 = 60$.

8) **C** The weight of the second item in kg is $1350 \div 1000 = 1.35$ kg. The weight of the third item in kg is $30 \div 1000 = 0.03$ kg. The total weight of all three items is $3.2 + 1.35 + 0.03 = 4.58$ kg.

9) **C** The total number of pairs of shoes is $3 + 4 + 2 = 9$. There are four pairs of white shoes. The probability is $\frac{4}{9}$.

10) **C** $3! + 4! + 5! = (3 \times 2 \times 1) + (4 \times 3 \times 2 \times 1) + (5 \times 4 \times 3 \times 2 \times 1)$
$= 6 + 24 + 120$
$= 150$
The smallest of the three consecutive numbers is 3.

11) **C** Gluing one pair of opposite edges together forms a cylinder. Gluing the other pair of opposite edges together, without twisting, connects the circular ends, forming the shape of a donut.

12) **B** The fifth person in line has four people standing in front of them. The number of people behind the fifth person is $4 \div 2 = 2$. Therefore, there are $4 + 1 + 2 = 7$ people standing in line.

13) **A** The first perfect square larger than 2 is $2^2 = 4$, and the last perfect square smaller than 300 is $17^2 = 289$. Therefore, the perfect squares between 2 and 300 range from 2^2 to 17^2. There are $17 - 1 = 16$ perfect squares in this range.

14) **D** Evaluate $3^2 = 9$ first. Then, raise 2 to the exponent 9 to get a result of 512.

15) **C** The sum of the completed row is $11 + 9 + 10 = 30$. Therefore, the missing number in the diagonal with the two tens is $30 - 10 - 10 = 10$. The value of the * is $30 - 11 - 10 = 9$

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16) **D** The prime factorization of 252 is $2^2 \times 3^2 \times 7$. The sum of the prime factors of 252 is $2 + 2 + 3 + 3 + 7 = 17$.

17) **B** Relocate to make the calculation easier.

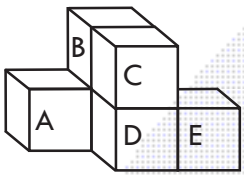
$3 \times (-22) \div 33 \times (-2) \div (-4) \div 17 \times (-3) \times (-34) \div (-9) \times 3$
$= 3 \times (-22) \div 33 \times (-34) \div 17 \times (-2) \div (-4) \times (-3) \times 3 \div (-9)$
$= 2$

18) **A** The fraction of chocolates left for Mustafa is $1 - \frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$.

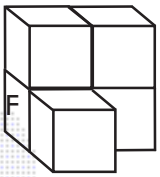
19) **C** Name the four toppings: A, B, C, and D. Doris chooses two toppings out of a possible four, and she can repeat toppings. The different combinations are: AA, AB, AC, AD, BB, BC, BD, CC, CD, DD. There are 10 different topping combinations.

20) **C** There are 10 intervals between 11 markers, therefore, the distance between the first marker and the eleventh marker is $10 \times 57 = 570$ cm. Taking into consideration the width of each marker, the total distance is $570 + 11 \times 2 = 592$ cm.

21) **A** The side view reveals cube F that is not seen in the front view. There are six cubes in total labelled A to F. Cube A has 5 cube faces, cube B has 4, cube C has 4, cube D has 3, cube E has 5, and cube F has 3. The number of cube faces the solid has is 24.



Front view



Side view

22) **C** If each tile is 28 cm wide, then $420 \div 28 = 15$ tiles will fit along the side that measures 420 cm. Similarly, $336 \div 28 = 12$ tiles will fit along the side that measures 336 cm. Therefore, $15 \times 12 = 180$ tiles are needed to cover the floor.

23) **D** If the average of 10 numbers is 82, then the sum of the numbers is $82 \times 10 = 820$. When an 11^{th} number is added, the sum of the numbers is $85 \times 11 = 935$. Subtracting the two totals gives $935 - 820 = 115$ as the 11^{th} number.

24) **B** Applying the rules of the game, the number following 13 would be $13 \times 3 + 1 = 40$. The number following 40 would be $40 \div 2 = 20$. The complete sequence of numbers is: 13, 40, 20, 10, 5, 16, 8, 4, 2, 1. A total of nine steps are required to reach the number 1 and win the game.

25) **C** The digits that can be used are 0, 1, 2, 3, and 4. The three-digit numbers that have digits that add up to 4 in ascending order are: 103, 112, 121, 130, 202, 211, 220, 301, 310, and 400. There is a total of 10 numbers.

26) **C** Regroup and add the numbers from 1 to 10: $1 + 9 + 2 + 8 + 3 + 7 + 4 + 6 + 5 + 10 = 55$ The only number that could have been omitted is 7 because $55 - 7 = 48$, and 48 is one less than the perfect square 49.

27) **D** I can read at a rate of $18 \div 3 = 6$ pages a day. My friend can read at a rate of $35 \div 7 = 5$ pages a day. Together, we can read $6 + 5 = 11$ pages a day. There are 30 days in April, so together we can read $11 \times 30 = 330$ pages.

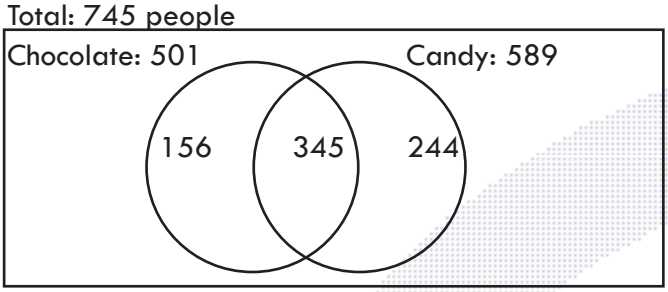
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28) **A** Find the GCF of 30 and 48 to find the greatest number of boxes that can be filled. The prime factorization of 30 is $2 \times 3 \times 5$ and the prime factorization of 48 is $2^4 \times 3$. The GCF is $2 \times 3 = 6$. The greatest number of boxes that can be filled is 6 with $48 \div 6 = 8$ pencils and $30 \div 6 = 5$ crayons in each box.

29) **A** Review the given options to find one that is certainly true.
Option A: True. If the team practices their drills, then it did not rain during the afternoon.
Option B: False. If it does not rain, practice will not necessarily happen.
Option C: False. If soccer practice happens, the team will not necessarily practice their drills.
Option D: False. If the team does not practice their drills, it doesn't necessarily mean that it rained during the afternoon.

30) **C** Use a Venn diagram. If 345 people like both candy and chocolate, then $501 - 345 = 156$ people like only chocolate and $589 - 345 = 244$ people like only candy. Since every person likes at least chocolate or candy, $345 + 156 + 244 = 745$ people were surveyed.
Total: 745 people



31) **C** If $a \sim b$ is defined as $ab - (a + b)$ find the value of $(2 \sim 4) \sim 8$
Evaluate the bracket first by inserting $a = 2$ and $b = 4$ into $ab - (a + b)$.

$$2 \sim 4 = 2 \times 4 - (2 + 4)$$
$$= 8 - 6$$
$$= 2$$

Then, evaluate $2 \sim 8$ by inserting $a = 2$ and $b = 8$ into $ab - (a + b)$.

$$2 \sim 8 = 2 \times 8 - (2 + 8)$$
$$= 16 - 10$$
$$= 6$$

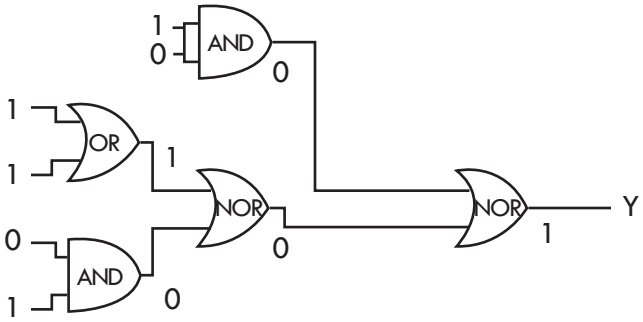
32) **B** Review the given options to find one that is false.
i) True. For example, 2 and 5 are both prime and their sum, 7, is also prime.
ii) False. If two prime numbers are multiplied together, then the product cannot be prime. The prime factorization of the product would include more factors than just 1 and itself.
iii) True. The greatest common factor of two numbers that are relatively prime is 1.
iv) The number 51 is not prime, so it would not be in the prime factorization of any number.

33) **C** Use prime factorization to find the number of numbers in a factor set by adding one to each exponent and multiplying. The prime factorization of $7560 = 2^3 \times 3^3 \times 5 \times 7$. Therefore, 7560 has $(3 + 1) \times (3 + 1) \times (1 + 1) \times (1 + 1) = 64$ factors in its factor set.

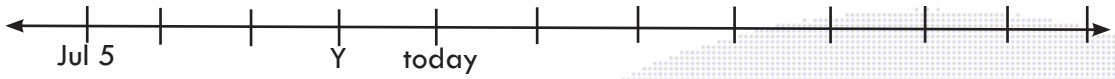
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34) **C** Moving from left to right, label each arrow with the output of the corresponding logic gate to find the output of the final logic gate.



35) **B** Work backwards from yesterday (Y) to July 5th using a timeline to get the position of July 5th. Y – 1 + 8 – 1 – 4 + 1 – 6 = July 5th. Once the position of July 5th is known, then determine the date of yesterday to be 5 + 3 = July 8th. Therefore, today is July 9th.



36) **C** The number of multiples of five from 1 to 300 inclusive is 300 ÷ 5 = 60. The biggest multiple of eight closest to but not exceeding 300 is 296. The number of multiples of eight from 1 to 296 inclusive is 296 ÷ 8 = 37. The number of numbers from 1 to 300 that are multiples of five or eight is the sum of the number of multiples of five and the number of multiples of eight, subtracting the number of multiples of the LCM of five and eight as they have been accounted for twice. The biggest multiple of 40 closest to but not exceeding 300 is 280. The number of multiples of 40 from 1 to 280 inclusive is 280 ÷ 40 = 7. Therefore, the number of multiples of five or eight from 1 to 300 is 60 + 37 – 7 = 90.

37) **B** The minute hand of a clock rotates 360° in an hour which is a full circle. Thus, the minute hand of a clock travels 360° ÷ 60 = 6° per minute. Since two hours and 25 minutes is 9 × 60 + 15 = 555 minutes, the minute hand traveled 555 × 6° = 3330°. The hour hand of a clock travels 360° ÷ 12 = 30° in an hour or 30° ÷ 60 = 0.5° per minute. In 555 minutes, the hour hand traveled 555 × 0.5° = 277.5°. Combined, the minute hand and the hour hand traveled 3330 + 277.5 = 3607.5°.

38) **D** Make a chart to help you count, sorting by the number of times the digit 7 appears in the ones, tens, and hundreds column in different intervals. For example, from 1 to 99, a 7 appears in the ones column in the numbers 7, 17, 27, 37, 47, 57, 67, 77, 87, and 97 for a total of 10 times. In the same interval, a 7 appears in the tens column in the numbers 70, 71, 72, 73, 74, 75, 76, 77, 78, and 79 for a total of 10 times. Continue filling in the chart for the remaining intervals. The digit 7 appears 86 + 80 + 100 = 266 times from 1 to 865.

	Ones	Tens	Hundreds
1 to 99	10	10	0
100 to 199	10	10	0
200 to 699	50	50	0
700 to 799	10	10	100
800 to 865	6	0	0
Total	86	80	100

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39) **C** The number of people who live in B and work in A is $\frac{1}{3} \times 120 = 40$. The number of people who live in C and work in A is $\frac{1}{8} \times 160 = 20$. To find the the number of people that live in A and work in A, find out how many people live in A and work outside of A. The number of people who live in A and work in B is $\frac{1}{4} \times 100 = 25$. The number of people who live in A and work in C is $\frac{1}{5} \times 100 = 20$. Therefore, the number of people who live and work in A is $100 - 25 - 20 = 55$. The total number of people who work in A is $40 + 20 + 55 = 115$.

40) **B** Evaluate according to the order of operations.

$$-2 \times (-7)^2 \div 14 - 3 \times (5 \times 4 \div 5 \times 4) \div 2^3 \times 6 - (7 - 3 \times 4)^2 \div (-5)$$
$$= -2 \times 49 \div 14 - 3 \times 16 \div 8 \times 6 - 25 \div (-5)$$
$$= (-7) - 36 - (-5)$$
$$= -38$$

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