Mathematica Centrum

Together, let's shape the mathematicians of the future

BYRON=GERMAIN PREPARATORY TEST 2019
DETAILED SOLUTIONS

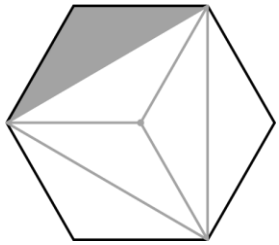
1. The missing number in the equation: 8 x 3 = 4 x ? is 6.

2. The sum of 8 + 50 + 200 + 6 000 is 6 258.

3. The value of (15 ÷ 3) x (16 - 9) is a multiple of (5 X 7) 5.

4. 20 nickels = 4 quarters.

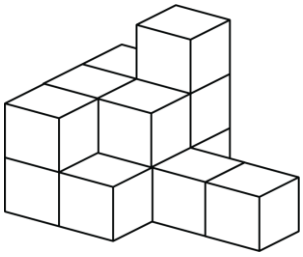
5. The fraction of the hexagon that is shaded is 1/6.



6. A natural number is multiplied by 7. The result could not be 88.

7. There are ((2 x 6 - 1) + 3) 14 blocks in the pile?

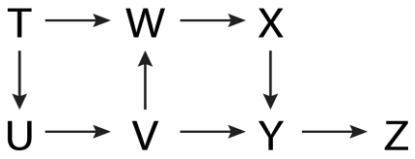
8. If the last day of January is a Wednesday, then January 10 (31, 24, 17, 10) was a Wednesday and January 11 was a Thursday.



9. When twice 100 (200) is multiplied by one quarter of 12 (3), the result is (200 x 3) 600.

10. 10 dm = 1 m

11. T, U, V, W, X, Y, and Z are players that participated in a chess tournament. T → U means that T has won a game against U. Only one player (Z) has not won a single game.

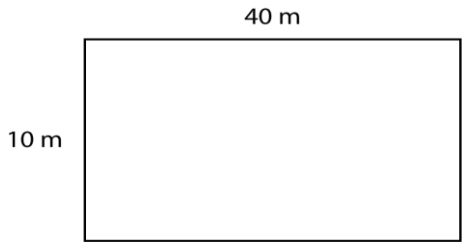


12. A 2-digit natural number is multiplied by a 2-digit natural number. The product could have a minimum of (10 x 10 = 100) 3 digits, but must have less than (100 x 100 = 10 000) 5 digits. The product could be a natural number that has 4 digits.

13. The 3!! does not refer to the double factorial function (which is way beyond the scope of this test) but to the factorial function iterated twice. The expression 3!! means here (3!)!. The value of 3!! is (3!)! = 6!. The expression 2! x 3!! (2 x 6!) is the largest. By the way 2! = 2!! = 2!!! = 2.

14. Andrea removed 7 coins having a total value of 82¢. She removed 2 pennies, 2 quarters, and 3 dimes.

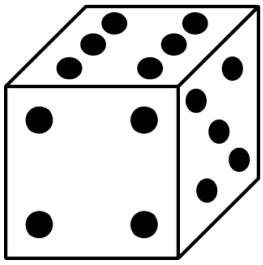
15. The perimeter will increase by (2 x 5 + 2 x 5) 20 m.



16. If I weigh 20 kg more than half of my weight, half of my weight must be equal to 20 kg. I must weigh (2 x 20 kg) 40 kg.

17. If you could spend $1 every second, you could spend (60 x $1) $60 every minute.

18. A die is rolled once. The probability of getting a 6 is (1 chance out of 6 possible outcomes) 1/6.



19. All even multiples of 3 are multiples of (2 x 3) 6. The first multiple of 6 between 0 and 100 is 6 = 1 x 6, the second is 12 = 2 x 6, the third is 18 = 3 x 6, … .). The last multiple of 6 between 0 and 100 is 96 = 16 x 6. There are 16 even multiples of 3 between 0 and 100.