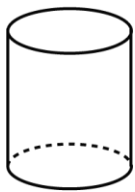


Mathematica Centrum

Together, let's shape the mathematicians of the future

BYRON-GERMAIN PREPARATORY TEST 2018 DETAILED SOLUTIONS

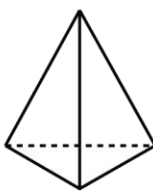
1. The solid which has 12 edges is the rectangular prism D.



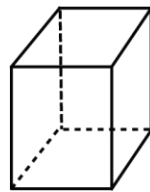
A



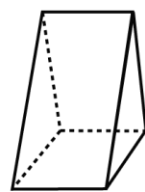
B



C



D



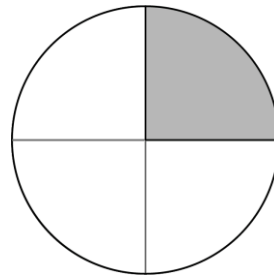
E

2. You can buy ($24 \div 5 = 4R4$) four \$5 cereal boxes with \$24.

3. The value of X in the equation: $2 + 9 + X + 3 - 2 = 13$ is 1.

4. The quotient of $210 \div 70$ is 3.

5. The fraction of the pie that has been eaten is $\frac{1}{4}$.



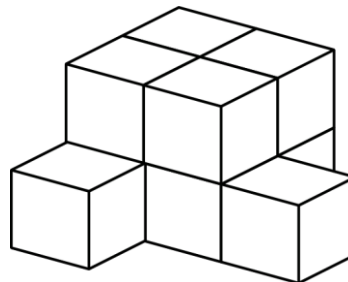
6. Forty dimes = \$4 = 16 quarters. The value of the ? in the equation: $20 \text{ quarters} = ? \text{ quarters} + 16 \text{ quarters}$ is 4.

7. The tens digit in the product of 9×15 is ($9 \times 15 = 10 \times 15 - 1 \times 15 = 135$) 3

8. There are ($2 \times 4 + 2$) 10 blocks in the pile.

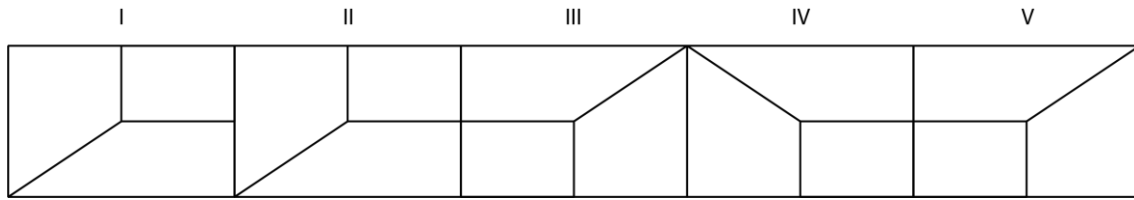
9. The next term in the sequence 2, 3, 5, 8, 13, 21, ... is ($13 + 21$) 34.

10. Mathew has ($(30 - 6) \div 2$) 12 books. Mathilda has ($30 - 12$) 18 books.



11. $10 \text{ mm} = 1 \text{ cm}$

12. Mathilda used a reflection (symmetry) to transform figure IV into figure V.

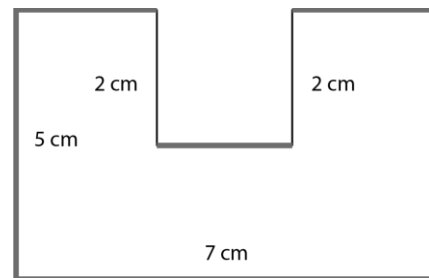


13. The number of sides (6) plus the number of angles (6) in a hexagon is equal to $(6 + 6)$ 12.

14. A heart beats 10 times every 10 seconds. It beats once every second. In 2 minutes (120 seconds) it will beat 120 times.

15. Mathilda watched 120 minutes of a 3 hour movie. She watched 120 minutes (2 hours) of a 3 hour movie. She watched (2 hours out of 3 hours) $\frac{2}{3}$ of the total movie.

16. The perimeter of the original 7 cm x 5 cm rectangular carton represented in bold colour is $(2 \times (7 + 5))$ 24 cm. The perimeter of the carved carton shown here in the diagram is $(24 \text{ cm} + 2 \times 2 \text{ cm})$ 28 cm.



17. The sum of two consecutive odd numbers is 16. The product of these two consecutive odd numbers (7 and 9) is (7×9) 63.

18. Let 's suppose it is 3 o'clock (fig.1). When the minute hand of the clock goes around once (60 minutes), the hour hand moves a distance of 1 hour, from 3 to 4 (fig. 2) or $\frac{1}{12}$ of the clock's circle. If the minute hand goes around 60 times, the hour hand will go around $(60 \div 12)$ 5 times.

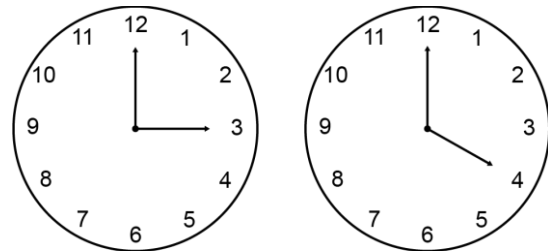
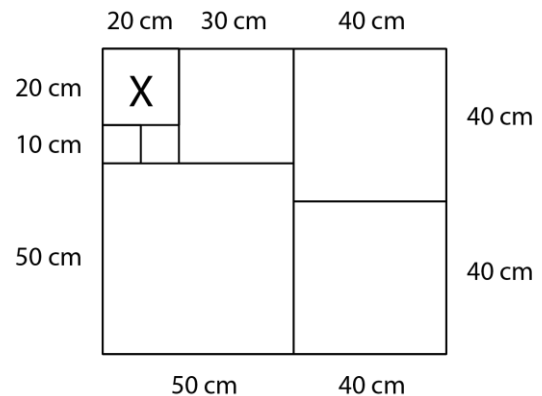


fig. 1

fig. 2

19. A bag contains 4 red balls, 3 green balls, and 2 blue balls. There are 9 balls in the bag. There are only 2 blue balls out 9 balls in the bag. If you randomly choose one of these balls, the probability that the ball chosen is blue is $\frac{2}{9}$.

20. Melissa has used square tiles to completely cover a 80 cm x 90 cm rectangular surface. Starting from the two squares on the right ($80 = 2 \times 40$), we can deduce the length of the sides of all the squares. The length of the side of tile X is 20 cm.



21. The total amount paid (\$30) being even, Matusalem has bought an even number of \$3 containers. He could not have bought 12 containers ($12 \times \$3 = \36), he must have bought 8.