

Abel Mathematics Contest

Grades 4 and 5
May 2011



"It appears to me that if one wishes to make progress in mathematics,
one should study the masters and not the pupils."

Niels Henrik Abel
1802-1829

Instructions:

1. Calculators may be used.
2. Circle the correct answer.
3. Transfer your answers to the Answer Form.
4. The time limit for the Niels Henrik Abel Mathematics Contest is one hour.

1. The product of two whole numbers is 11. What is the sum of these numbers?
- A. 11 B. 10 C. 5 D. 12
2. Calculate: $2 + 2 - 2 + 2 - 2 + 2 - 2 + 2 - 2 + 2$
- A. 0 B. 2 C. 4 D. 12
3. Tim got as birthday presents from his friends 10 coloured pencils, 3 matchbox cars, 4 balls, 1 book, 3 little teddy bears, and 2 chocolates. How many things did he get?
- A. 15 B. 17 C. 20 D. 23
4. Which of the following is **not** a whole number?
- A. $5+3$ B. $5-3$ C. 5×3 D. $5 \div 3$
5. What is the average of 16, 28 and 82?
- A. 42 B. 26 C. 46 D. 28
6. Sophie draws coloured beans: a blue one, then a green one, then a red, then a black, a blue, a green, a red, a black, and so on in the same order. What colour is the 29th coloured bean?
- A. Blue B. Green C. Red D. Black
7. I had 54¢. I doubled the number of nickels, and now have 84¢. How many nickels do I have now?
- A. 6 B. 12 C. 30 D. 10
8. When 3 is added to an even number, the new number must be
- A. prime B. divisible by 3 C. even D. odd
9. Tom has nine \$100 bills, nine \$10 bills, and ten \$1 coins. How much money does he have?
- A. \$1000 B. \$991 C. \$9910 D. \$28
10. Which of the following is the greatest number?
- A. $2 + 0 + 0 + 3$ B. $2 \times 0 \times 0 \times 3$ C. $(2 + 0) \times (0 + 3)$ D. $20 \times 0 \times 3$

11. $18 : 2 = 45 : \underline{\hspace{1cm}}$

- A. 4 B. 5 C. 6 D. 7

12. The human heart beats approximately 70 times per minute. How many beats will it make in one hour?

- A. 4 200 B. 7 000 C. 700 D. 420

13. Adding 17 to the smallest two-digit number and dividing the sum by the biggest one-digit number, we get:

- A. 3 B. 6 C. 9 D. 11

14. Joseph lives on a short street where the houses are numbered sequentially from 1 to 24. How many times does the digit 2 occur in the numbers of those houses?

- A. 2 B. 4 C. 8 D. 16

15. Here is one addition example: each shape replaces a digit, different shapes replace different digits and the same shapes replace the same digit. What is the sum of the “square” and the “circle”?

$$\begin{array}{r}
 \square \square \square \\
 + \square \triangle \bigcirc \\
 + \square \square \triangle \\
 \hline
 2 \quad 0 \quad 1 \quad 1
 \end{array}$$

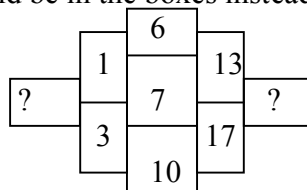
$$\square + \bigcirc = ?$$

- A. 6 B. 8 C. 12 D. 14

16. Parm added 3 g of salt to 17 g of water. What is the percentage of salt in the solution?

- A. 20% B. 17% C. 16% D. 15%

17. What numbers should be in the boxes instead of the ?-signs?



- A. 2 and 14 B. 2 and 30 C. 3 and 221 D. 4 and 30

18. If I start with \$100, increase this by 40%, and then decrease the new amount by 40%, how much money will I have?

- A. \$50 B. \$60 C. \$84 D. \$100

19. The length of a radius of a circle is 30 cm. A line segment is drawn between 2 points on the circle. The length of this line segment cannot be

- A. 50cm B. 70cm C. 60cm D. 1cm

20. Emily leaves her house at 6:55 am and arrives at school at 7:32 am. Her friend Dianne arrives at school at 7:45 am even though she lives closer to the school and it takes her 12 minutes **less** than Emily to get there. When does Dianne leave her house?

- A. 7:07 am B. 7:20 am C. 7:25 am D. 7:33 am

21. You have six sticks of lengths 1 cm, 2 cm, 3 cm, 2001 cm, 2002 cm and 2003 cm. You have to choose three of these sticks and form a triangle. How many different choices of three sticks are there which work?

- A. 6 B. 10 C. 3 D. 11

22. Four friends go to a restaurant and sit down at a table. John always sits at the same spot on the table. In how many ways can the friends sit around the table?

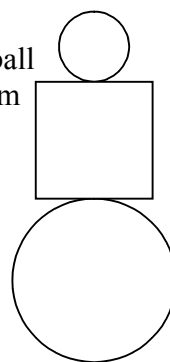
- A. 3 B. 4 C. 6 D. 24

23. There are 24 students in a class, and $\frac{3}{4}$ of them are girls. How many boys are there?

- A. 6 B. 12 C. 18 D. 24

24. The picture shows a structure of two balls and one cubic box. The radius of the lower ball is 6 cm, the radius of the upper ball is three times less. The side of the cubic box is 4 cm longer than the radius of the upper ball. How tall is this structure?

- A. 14 cm B. 20 cm C. 22 cm D. 24 cm



25. From 4 days 3 hours 21 minutes, subtract 1 day 2 hours 34 minutes.

- A. 3 days 0 hours 47 minutes B. 5 days 6 hours 55 minutes
C. 3 days 1 hour 13 minutes D. 3 days 4 hours 56 minutes