

Abel Mathematics Contest

Grades 4 and 5

May 2018



"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. Select the best answer.
3. Transfer your answers to the Answer Form.
4. Diagrams are not always drawn to scale.
5. The time limit for the Niels Henrik Abel Mathematics Contest is one hour.

1. The number 36 has the property that it is divisible by the digit in the unit position, because 36 is divisible by 6. The number 38 does not have this property. How many numbers between 20 and 30 have this property?

- A) 2 B) 3 C) 4 D) 5 E) 6






2. The incorrect equation $1 + 3 + 6 \times 2 = 22$ may be made correct by increasing one of the numbers in it by 1. Which number should it be?

- A) 1 B) 3 C) 6 D) 2 E) 22

3. Ann rides her bicycle throughout the afternoon with constant speed. At the beginning and at the end of the route, her watch shows the time, as in the diagram:



Which picture shows the position of the minute hand when Ann finishes one third of the ride?

- (A)  (B)  (C)  (D)  (E) 

4. A stack of books is to be moved to the library. If Kiran does the job alone, it will take one hour. If Wei does the job alone, it will take two hours. How long will it take if Kiran and Wei do the job together?

- A) 30 min B) 40 min C) 1 hour D) 1.5 hours E) 3 hours

5. Adnan paid for 5 special slushies with a \$50 bill and got \$16 in change. How much did each special slushy cost?

- A) \$5.20 B) \$6.80 C) \$8.20 D) \$8.80 E) \$3.20

6. A square piece of paper has a perimeter of 36 cm. What is the area of a square piece of paper with twice that perimeter?

- A) 72 cm^2 B) 108 cm^2 C) 144 cm^2 D) 136 cm^2 E) 324 cm^2

7. Su sits on a seesaw waiting for her friend Seth. Seth left on a Saturday and will be back seventeen days later. Seth will be back on a

- A) Sunday B) Tuesday C) Thursday D) Friday E) Saturday

8. Wayne goes to bed exactly 65 minutes after 8:30 P.M. At what time does Wayne go to bed?

- A) 9:05 PM B) 9:25 PM C) 9:35 PM D) 9:45 PM E) 9:35 AM

9. $(10 \text{ hundreds}) + (10 \text{ ones}) = \underline{\quad? \quad}$ tens

- A) 10 B) 101 C) 110 D) 1010 E) 11

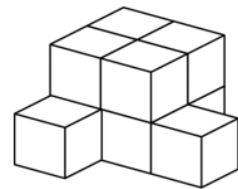
10. What is the value of the ? in this equation?

$20 \text{ quarters} = \underline{\quad? \quad} \text{ quarters} + 40 \text{ dimes}$

- A) 6 B) 7 C) 8 D) 5 E) 4

11. How many blocks are there in the pile at right?

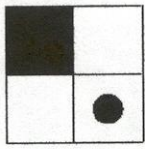
- A) 10 B) 11 C) 12 D) 13 E) 14



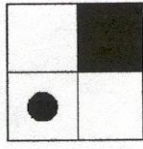
12. A bag contains 4 red balls, 3 green balls, and 2 yellow balls. If you randomly choose one of these balls, what is the probability that the ball chosen is yellow?

- A) $2/6$ B) $2/9$ C) $2/5$ D) $2/3$ E) $1/2$

Study Figures I and II.



I



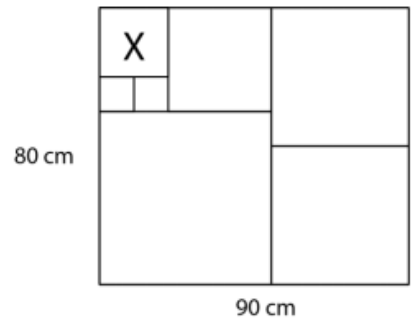
II

13. Which transformation of Figure I is shown in Figure II?

- A) Rotation B) Reflection C) Translation D) No transformation

14. Melissa has used square tiles to completely cover a 80 cm x 90 cm rectangular surface as in the diagram at right. What is the length of the side of tile X?

- A) 30 cm B) 20 cm C) 25 cm D) 10 cm E) 15 cm



15. What is the value of X in the equation:

$$512 = 317 + X$$

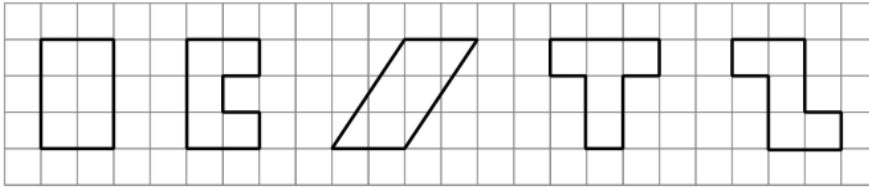
- A) 192 B) 193 C) 194 D) 195 E) 196

16. What fraction of the figure at right is shaded?

- A) 1/5 B) 1/2 C) 1/3 D) 1/4 E) 2/5

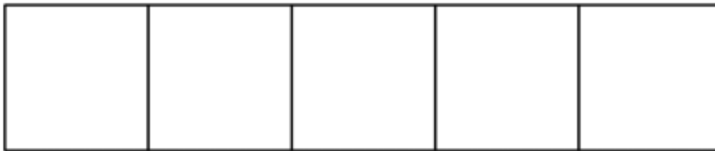


17. Given that the side of a small square is 1, how many of the following have a perimeter of 12?



- A) 1 B) 2 C) 3 D) 4 E) 5

18. A square table can sit 4 people. If you line up 5 square tables, as shown in the diagram, you can sit 12 people. If 100 square tables were lined up in the same manner, how many people could you sit?

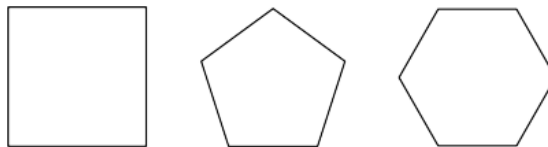


- A) 201 B) 202 C) 204 D) 203 E) 206

19. $(1 + 2 + 3) \times 10 = 30 + 20 + \underline{\quad? \quad}$

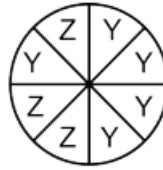
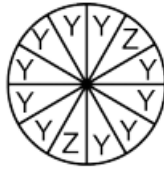
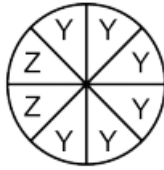
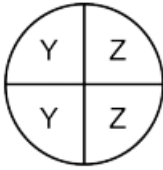
- A) 10 B) 11 C) 33 D) 44 E) 1

20. The number of lines of symmetry in a square plus the number of lines of symmetry in a regular pentagon plus the number of lines of symmetry in a regular hexagon is equal to:



- A) 14 B) 17 C) 16 D) 13 E) 15

21. The probability of getting a Z is the same for two of the following 5 spinners. What is this probability?



A) $1/6$

B) $1/3$

C) $3/8$

D) $1/2$

E) $1/4$

22. Which fraction is smallest?

A) $\frac{1}{6}$

B) $\frac{2}{3}$

C) $\frac{1}{3}$

D) $\frac{1}{2}$

E) $\frac{2}{6}$

23. Which fraction is greatest?

A) $\frac{1}{2}$

B) $\frac{5}{8}$

C) $\frac{3}{4}$

D) $\frac{7}{10}$

E) $\frac{4}{5}$

Use the number line below to indicate the answers for the next two questions:

24. Which letter represents the decimal 0.04?

25. Which letter represents the fraction $1/9$?

