

Special thank you to Simon Gidrewicz, Armin Jessa, Landry Moroz, and Marshall Turner for their help in designing questions!

Instructions:

1. Do not open this booklet until you are told by your teacher to begin.
2. Materials: pencil, paper — no other materials. NO calculators!
3. You will have exactly **60 minutes** to work on the contest.
4. This form has 9 questions in Part A, 9 questions in Part B, and 5 questions in Part C.
5. This is a multiple choice contest. Each question is followed by five possible answers marked A, B, C, D, and E. Only one of these is correct. After making your choice, fill in the appropriate circle on the response form.
6. Scoring:
 - Each correct answer is worth:
 - 4 points in Part A,
 - 5 points in Part B,
 - 6 points in Part C.
 - Each unanswered question is worth 2 points.
 - Incorrect answers are worth 0 points.

Part A (4 points each)

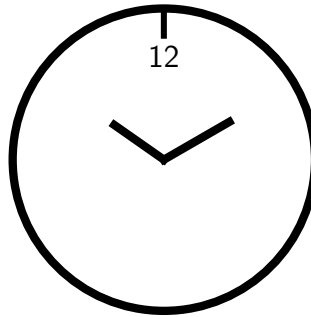
1. Which of the following expressions is equal to 2024?

- (A) $0 \times 2 + 4 + 2 \times 1000$
- (B) $20 \times 100 + 0 \times 24$
- (C) $0 + 24 + 2 \times 1000$
- (D) $200 \times 10 \times 0 \times 24$
- (E) $200 \times 10 + 0 \times 24$

2. Anirvan is 36 years old, Liam is half as old as Anirvan, and Quincy is 4 years younger than Liam. How old is Quincy?

- (A) 14 (B) 16 (C) 18 (D) 22 (E) 32

3. Most of the numbers disappeared from this clock. Estimate the time it shows.



- (A) 2:50 (B) 3:45 (C) 9:15 (D) 10:10 (E) 6:30

4. A square has an area of 64 cm^2 . What is the square's perimeter?

- (A) 8 cm (B) 16 cm (C) 32 cm (D) 64 cm (E) 128 cm

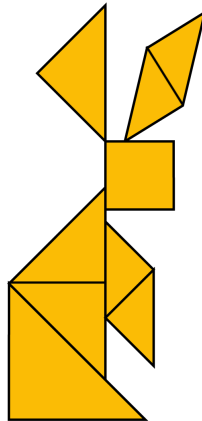
5. How many prime numbers are between 20 and 40?

- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7

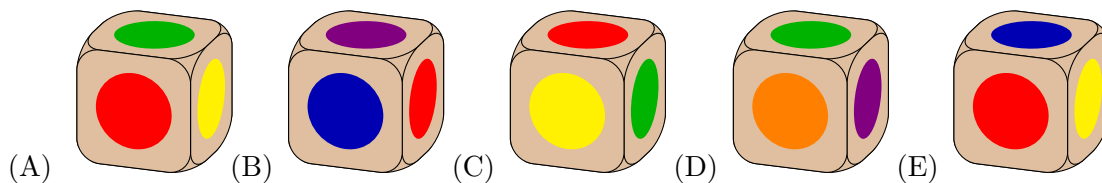
6. The sum of 3 consecutive numbers is 51. What is the smallest of the 3 numbers?

- (A) 16 (B) 17 (C) 18 (D) 19 (E) 20

7. How many parallelograms are in the diagram below?



- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5
8. The year 2024 is a leap year since February has 29 days. Leap years occur every four years. If someone is born on February 29, 1980, how many times will they be able to celebrate their birthday on February 29 before the date February 7, 2024? (They did not celebrate a birthday on the day they were born.)
- (A) 7 (B) 8 (C) 9 (D) 10 (E) 11
9. Four of the following images are of the same die, and one of them is of a different die. Which one is the image of the different die?



Part B (5 points each)

10. What is $\frac{1}{6} + \frac{1}{8} + \frac{1}{12}$?

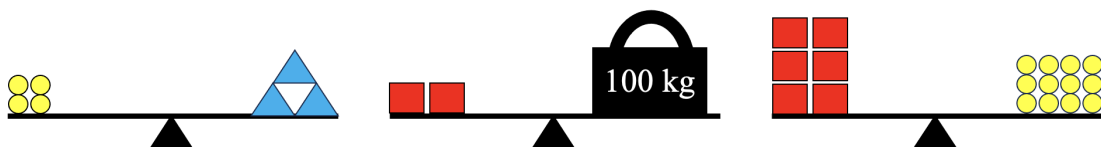
- (A) $\frac{3}{26}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) $\frac{3}{8}$ (E) $\frac{1}{2}$

11. In a basket there were 3 red apples, 2 bananas, and 1 toy car. Grayson took three fruit from the basket. Which statement must be correct about what was taken?
- (A) at least one fruit is a banana
 (B) all of the fruits are apples
 (C) one fruit is an apple and two fruits are bananas
 (D) one fruit is a banana and two fruits are apples
 (E) at least one fruit is an apple
12. When dividing Lincoln's age by 2, 6, or 9 there is always a remainder of 1. Which of the following options could be Lincoln's age?
- (A) 12 years old (B) 26 years old (C) 35 years old (D) 55 years old (E) 71 years old
13. In a number maze, you start with a number and complete an operation every time you move to a new square. Breanna goes through the following number maze from start to finish. At the end, she observes that she never had an odd number at any point during her path through the maze. If her number at the end was 14, what was her number at the start? (She did not return to any square she had previously been before and only moves horizontally or vertically.)

Start	+2	-4	+9	-3
$\times 2$	+5	$\times 3$	-5	+1
+3	-7	+6	$\div 3$	+8
+11	$\times 4$	-1	+7	Finish

- (A) 10 (B) 12 (C) 2 (D) 4 (E) 6

14. Given the following scales, what is the mass of three triangles?

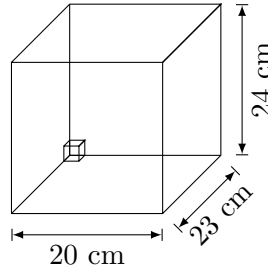


- (A) 45 kg (B) 75 kg (C) 87.5 kg (D) 100 kg (E) 125 kg

15. The six-digit number 56A9B2 is divisible by 3. Which of the following could be the values of A and B?

- (A) 7, 4 (B) 3, 6 (C) 5, 1 (D) 1, 9 (E) 0, 9

16. How many $2\text{ cm} \times 2\text{ cm} \times 2\text{ cm}$ blocks can fit inside a $20\text{ cm} \times 23\text{ cm} \times 24\text{ cm}$ box?

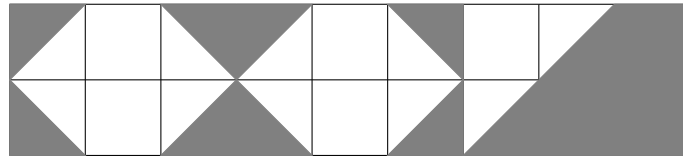


- (A) 1320 (B) 1380 (C) 11040 (D) 10560 (E) 2760

17. Kensie, Kendall, Keira, and Kali are siblings. The sum of their ages is 47. If Kensie is 14, how old will she be when the sum of all siblings ages is 75?

- (A) 61 (B) 25 (C) 21 (D) 56 (E) 89

18. What fraction of the rectangle is shaded?



- (A) $7/18$ (B) $4/19$ (C) $1/3$ (D) $4/9$ (E) $1/2$

Part C (6 points each)

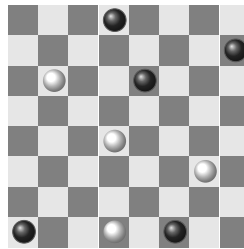
19. When Renert Rabbit is in a hurry, it can hop at a speed of 20 meters every 3 seconds. When it is relaxed, it hops at half that speed. How many kilometres can Renert Rabbit hop in one hour if it is relaxed?

- (A) 0.2 (B) 2 (C) 6 (D) 12 (E) 24

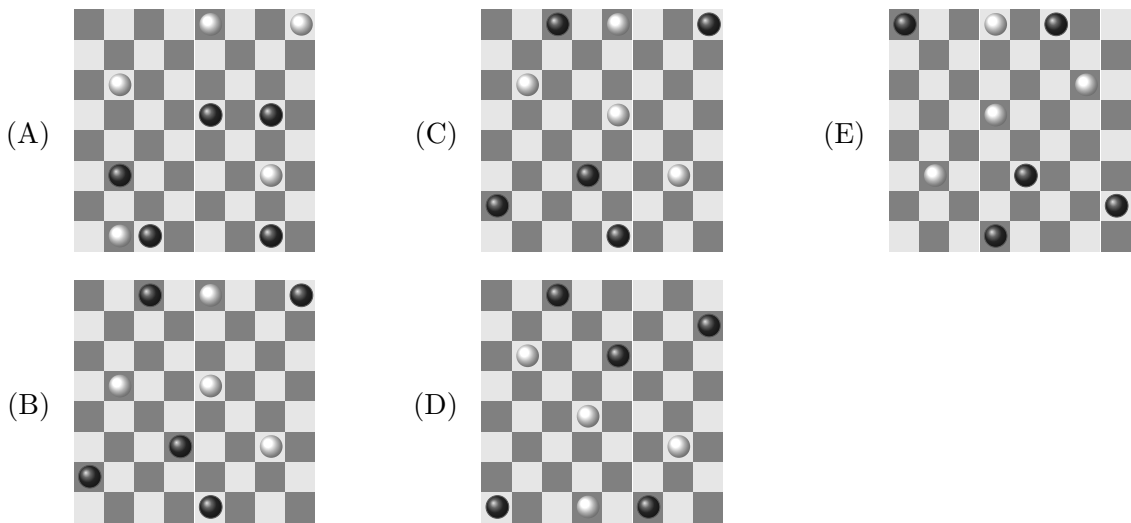
20. Hugo loves patterns and gardening. This spring he planted a total of 125 vegetables consisting of carrots (C), spinach (S), and beets (B). Hugo planted the vegetables in the following pattern: CCSCBCCSCBB... How many beets did he plant in total?

- (A) 4 (B) 11 (C) 40 (D) 41 (E) 44

21. Renert Rabbit put 5 black tokens and 4 white tokens on her checkerboard.



She decides to move the pieces so that the resulting board has its pieces mirrored both horizontally and vertically from the original. What does the board look like now?

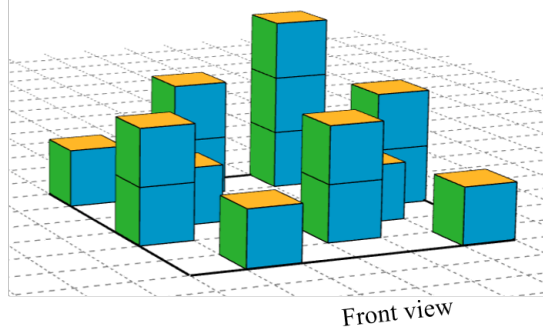


22. Ms. Marina brought 8 purple candies, 7 red candies, and 10 orange candies to give students in her math class. It turned out that some of the candies melted. Among purple and red candies a total of 10 melted. Among orange and purple candies a total of 11 melted. Among red and orange candies a total of 9 melted. How many red candies did **not** melt?

- (A) 1 (B) 3 (C) 4 (D) 6 (E) 7

23. A 6 by 6 grid is shown, where each square can either have nothing on it, or cubes on it, ranging from 1-3 per square. Lucy decides to set up a board as shown in the following diagram (numbers represent how many blocks in that stack). What does Lucy see when looking at the front of the board (the blue faces of the blocks)?

1	2	3			
	1				2
2				1	
		2			
1					1



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