
The Excel Math Competition



Sep 2025(Elementary Level Exam)

1. This is a 60 minute individual exam.
2. No collaboration or external devices (like a calculator) are allowed.
3. The first 10 questions are worth [5] points each and are multiple choice.
4. The last 5 questions are worth [10] points each and are short response.
5. Each of the final 5 questions have answers which are positive integers between 000 and 999, inclusive.
6. The questions are arranged in roughly ascending difficulty.
7. If you believe a question is seriously flawed, or have an answer which is not one of the listed answers, there will be a 10-minute dispute period after the test, after which no disputes will be accepted.
8. In the event of a dispute, **leave the question blank** and let your proctor know after the testing time ends.
9. All disputes will be considered on an individual-by-individual basis, so no student will receive credit if they did not submit a dispute, except for in the case of a question being thrown out.

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1 [5]

At this point in time, David is double Rayan's age. When David and Rayan are 3 years older, David is 21. How old was Rayan before the 3 years?

- a) 6 b) 7 c) 8 d) 9 e) 10

2 [5]

$$3 + 2 \div 1 + 3$$

- a) 3 b) 4 c) 6 d) 7 e) 8

3 [5]

Find the next term in this sequence:

$$\{1, 1, 1, 1, 4, 7, 13, 25, \dots\}$$

- a) 35 b) 42 c) 45 d) 49 e) 52

4 [5]

I am thinking of a special number. If you double it and add 5, you get 27. What is my number?

- a) 10 b) 11 c) 12 d) 13 e) 14

5 [5]

Simplify the following expression:

$$1 + 1 - 1 + 1 - 1 + \dots + 1 - 1$$

- a) -2 b) -1 c) 0 d) 1 e) 2

6 [5]

Can π be represented as a fraction? (Only answer with *A* or *B*)

- a) Yes b) No c) ... d) ... e) ...

7 [5]

$$2025^2 - 2024^2 = ?$$

- a) 2024 b) 2025 c) 4048 d) 4049 e) 8096

8 [5]

What does the following evaluate to:

$$\frac{1}{3} \cdot \frac{2}{4} \cdot \frac{3}{5} \cdot \dots \cdot \frac{17}{19} \cdot \frac{18}{20}$$

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

b) $\frac{1}{19}$

c) $\frac{1}{190}$

d) $\frac{1}{380}$

e) $\frac{1}{20}$

9 [5]

How many 0's are in the value of:

$$10 \cdot 100 \cdot 1000 \cdot \dots \cdot 1000000$$

a) 6

b) 10

c) 15

d) 21

e) 28

10 [5]

$$10^3 + 25^3 = ?$$

a) 35

b) 975

c) 16625

d) 34125

e) 35000

11 [10]

Suppose that $A * B$ is defined as $A^2 - 3AB + 2B^2$. Find $3 * (1 * 2)$

12 [10]

$$x + \frac{1}{x} = 4$$

Give the value of L if:

$$\left(x^3 + \frac{1}{x^3}\right) - \left(x^2 + \frac{1}{x^2}\right) = L$$

13 [10]

What is the sum of all integers less than or equal to 100 that have an odd number of factors?

14 [10]

David finds himself trapped in a magical room with 3 doors. One door leads to tunnel featuring a 10 minute walk to the outside. The second leads to a loop that takes 20 minutes to walk through before returning to the magical room. The third leads to a loop as well, which takes 30 minutes to walk through before returning to the magical room. Also, because the room is magical, each time David returns to the room, the doors are in a randomized order. What is the expected number of minutes it will take David to escape the room, given that he does not know which door leads outside but will continue to keep going through a random door whenever he finds himself back in the magical room?

15 [10]

Ryan is collecting leaves. He collects 2 red leaves, 1 yellow leaf, and 1 orange leaf, and decides to treat each leaf like a "node" and makes connections between them with branches, creating "trees". A tree is, in this context, an arrangement of leaves connected with branches such that between any two pairs of distinct leaves, there is exactly one way to go from one leaf to another. How many distinct trees can he make, if every leaf of the same color is indistinguishable?

