

Sample problems for Math.Biz 2023 selection test

1. What is the minimum number of weights which enable us to weigh any integer number of grams of gold from 1 to 100 on a standard balance with two pans? (Weights can be placed only on the left pan)
 - a) 5
 - b) 6
 - c) 7
 - d) 8

2. A class consists of 10 students. Each of them has registered for 3 courses. Each course instructor conducts an exam out of 50. The average percentage marks of all 10 students across all courses they have registered for, is 70%. Two of them apply for reevaluation in a course. If none of their marks reduce, and the average of all 10 students across all courses becomes 70.4%, the maximum possible increase in marks for either of the two students is
 - a) 2
 - b) 3
 - c) 4
 - d) 6

3. Let S_n be sum of the first n terms of an A.P. $\{a_n\}$. If $S_7 = S_{13}$, what is the ratio of $a_4 : a_7$
 - a) 13:7
 - b) 7:13
 - c) 7:4
 - d) 4:7

4. ABCD is a quadrilateral whose diagonals AC and BD intersect at O. If triangles AOB and COD have areas 4 and 9 respectively, then the minimum area that ABCD can have is
 - a) 26
 - b) 25
 - c) 21
 - d) 16

5. The profits of XYZ Company rose 10% from March to April, then rose by 50% from April to May, and then dropped 20% from May to June. What was the percent increase for the whole quarter, from March to June?

- a) 28%
- b) 32%
- c) 35%
- d) 40%

6. Match the following

1 Arithmetic mean	a. $\sqrt[n]{x_1 x_2 x_3 \dots x_n}$
2 Geometric mean	b. $\frac{t_{n+1}}{2} \dots$ where t_k is the k th observation in the data
3 Median	c. $(x_1 + x_2 + x_3 + \dots + x_n)/n$
4 Mode	d. The observation which repeats maximum number of types

- a) (1-a) (2-b) (3-c) (4-d)
- b) (1-c) (2-a) (3-d) (4-b)
- c) (1-c) (2-d) (3-b) (4-a)
- d) (1-c) (2-a) (3-b) (4-d)

7. Company AB is being sold, and both Company A and Company B were considering the purchase. The price of Company AB is 50% more than Company A has in assets, and this same price is also 100% more than Company B has in assets. If Companies A and B were to merge and combine their assets, the price of Company AB would be approximately what percent of these combined assets?

- a) 66%
- b) 78%
- c) 86%
- d) 115%

8. Consider the following two factually true statements:

1. Bill's mother tells him that smoking is unhealthy, and he must not do it.
2. Bill's mother smokes.

Based on the above two facts, Bill (purely based on logic) concludes "Smoking must not be bad; it is okay for me to smoke." Which of the following is true? (1 point)

- a) Bill's conclusion is logical using statement 1 and 2.
- b) Bill's mother should quit smoking before advising Bill to quit smoking.
- c) Statement 2 is irrelevant and therefore the conclusion should only be based on statement 1.
- d) It is Bill's personal choice whether he wants to quit smoking or not.

9. Which of the following statement about the picture below is true?



- a) Percentage bar graph will be more appropriate instead of pie chart
- b) Pie chart is the correct way to present the data
- c) Pie chart is incorrect because the survey participants could have selected multiple choices
- d) None of the above

10. Neha, a sales representative for a large consumer goods company, is paid 3% of the total profits earned by his company. Her company averages 10% profit on sales. If Neha's total income for the year was Rs. 60,000, what total sales did her company realize?

- a) Rs. 2 crores
- b) Rs. 20 lakhs
- c) Rs. 20 crores
- d) None of the above