NEXLYTIC STUDIO

Analyst Interview Maths: 20-Question Free Sample

Free sample

Twenty real practice questions with worked solutions, taken from the full Analyst Interview Maths Pack.

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Try these first

Give yourself 30 minutes, paper and a basic calculator. Solutions follow.

1. Monthly sales at a coaching centre rose from ₹4,50,000 to ₹7,20,000. What is the percentage increase?

2. A newsletter grew from 36,000 to 81,000 subscribers in 2 years at a constant yearly rate. What was the yearly growth rate?

3. A subscription earns ₹600 a month per user at a 50% gross margin. It costs ₹800 to acquire a user. What is the payback period in months?

4. Response times (ms) for 9 requests: 21, 78, 74, 62, 23, 41, 57, 35, 26. Find the median.

5. Five delivery times in minutes: 5, 3, 2, 11, 29. Find the population variance and standard deviation.

6. Two fair six-sided dice are rolled. What is the probability that the sum is 8?

7. Each of 4 independent emails has a 25% chance of being opened. What is the probability that at least one is opened?

8. A game costs ₹40 to play. You win ₹90 with probability 1/3 and nothing otherwise. What is the expected profit per play? Would you play?

9. A family has two children. You learn that at least one is a girl. What is the probability both are girls?

10. In a population of accounts, 0.1% are truly fraudulent. A fraud rule catches 99% of real fraud, but also wrongly flags 1% of genuine accounts. One account is flagged. What is the probability it is actually fraud?

11. A team of 3 must be chosen from 8 analysts. In how many ways can this be done?

12. How many distinct arrangements are there of the letters in the word DATASET?

13. Test scores are roughly normal with mean 500 and standard deviation 50. A candidate scores 400. Find the z-score and the proportion of candidates who scored lower.

14. A sample of 100 customers has mean spend 85 and the population SD is 20. Give the 95% confidence interval for the mean (use 1.96).

15. A/B test. Version A: 400 sign-ups from 5,000 visitors. Version B: 475 sign-ups from 5,000 visitors. Run a two-proportion z-test. Give z, the two-sided p-value, and whether B beats A at the 5% level.

16 You test 10 unrelated metrics, each at the 5% level, and none truly changed. How many false positives do you expect, and what is the probability of at least one?

17 Hours studied 1, 2, 3, 4, 5 and quiz scores 2, 5, 4, 9, 10 for five learners. Find the least-squares line score = a + b × hours.

18 Estimate annual spend. A city has 1,20,00,000 people. 10% use a food-delivery app, ordering 3 times a month at an average of ₹100. What is the yearly order value in ₹ crore? (1 crore = 10,000,000)

19 A product sells for ₹150. Each unit costs ₹110 to make, and fixed costs are ₹36,000. How many units must be sold to break even?

20 Two ad variants are tested on two audiences. Audience 1: A converts 90 of 100, B converts 19 of 20. Audience 2: A converts 10 of 50, B converts 90 of 400. Which variant is better in each audience, and which looks better overall?

Answers and worked solutions

Q1 **60%**

1. Change = ₹7,20,000 − ₹4,50,000 = ₹2,70,000
2. Percent change = change ÷ old value × 100 = 270 ÷ 450 × 100 = 60%

Q2 **50% a year**

1. Growth multiple = 81,000 ÷ 36,000 = 2.25
2. This equals (1 + g)^2, so 1 + g = 2.25^(1/2) = 1.5
3. g = 50% a year
4. Check: 1.5^2 = 2.25 ✓

Q3 **2.67 months**

1. Monthly gross profit per user = 50% × ₹600 = ₹300
2. Payback = ₹800 ÷ 300 = 2.67 months

Q4 **41**

1. Sort: 21, 23, 26, 35, 41, 57, 62, 74, 78
2. 9 values, so the median is the middle (#5) value = 41

Q5 **variance = 100, SD = 10**

1. Mean = 50 ÷ 5 = 10
2. Deviations from the mean: −5, −7, −8, 1, 19
3. Squared deviations: 25, 49, 64, 1, 361 (sum = 500)
4. Population variance = 500 ÷ 5 = 100
5. SD = √100 = 10

Q6 **5/36 ≈ 0.139**

1. There are 6 × 6 = 36 equally likely outcomes
2. Outcomes with sum 8: (2,6), (3,5), (4,4), (5,3), (6,2) → 5 outcomes
3. Probability = 5/36 = 5/36

Q7 **0.6836**

1. Easier to find the opposite: P(none) = (1 − 0.25)^4 = 0.316406
2. P(at least one) = 1 − 0.316406 = 0.6836

Q8 **−₹10 per play**

1. Expected winnings = 1/3 × ₹90 = ₹30
2. Expected profit = ₹30 − ₹40 = −₹10
3. A negative expected profit means you lose money on average, so do not play.

Q9 **1/3**

1. Equally likely families: GG, GB, BG, BB
2. 'At least one girl' leaves GG, GB, BG — three outcomes
3. Only GG has two girls, so the probability is 1/3 (not 1/2)

Q10 **9.0%**

1. Imagine 100,000 accounts. Fraud: 100; genuine: 99,900
2. Correctly flagged fraud = 99; wrongly flagged genuine = 999
3. P(fraud | flagged) = 99 ÷ (99 + 999) = 9.0%
4. A rare event plus an imperfect test means most flags are false alarms. This is the base-rate effect.

Q11 **56**

1. Order does not matter: C(8,3) = 8! ÷ (3! × 5!)
2. = 8 × 7 × 6 ÷ 6 = 56

Q12 **1,260**

1. 7 letters in total; repeated letters: A×2, T×2
2. Arrangements = 7! ÷ (2! × 2!) = 5,040 ÷ 4 = 1,260

Q13 **z = −2, proportion ≈ 0.0228**

1. z = (x − mean) ÷ SD = (400 − 500) ÷ 50 = −2
2. From the standard normal table, P(Z < −2) ≈ 0.0228
3. So about 2.3% scored lower.

Q14 **81.08 to 88.92**

1. SE = 20 ÷ √100 = 2
2. Margin = 1.96 × 2 = 3.92
3. Interval = 85 ± 3.92 = (81.08, 88.92)

Q15 **z ≈ 2.65, p ≈ 0.0079; significant**

1. $\hat{p}_A$ = 400/5000 = 0.0800, $\hat{p}_B$ = 475/5000 = 0.0950
2. Pooled $\hat{p}$ = (400 + 475) ÷ (5000 + 5000) = 0.0875
3. SE = √($\hat{p}$(1 − $\hat{p}$)(1/5000 + 1/5000)) = 0.00565
4. z = (0.0950 − 0.0800) ÷ 0.00565 = 2.65
5. Two-sided p-value = 2 × (1 − Φ(2.65)) = 0.0079
6. At 5%: p < 0.05, so the difference is statistically significant.

Q16 **expected 0.5; P(at least one) = 0.4013**

1. Expected false positives = 10 × 0.05 = 0.5
2. P(none) = 0.95^10 = 0.5987
3. P(at least one) = 1 − 0.5987 = 0.4013
4. This is why looking at many metrics and reporting the 'significant' one is misleading.

Q17 **score = 0 + 2 × hours**

1. $\bar{x} = 3$, $\bar{y} = 6$
2. Sxx = 10, Sxy = 20
3. Slope b = Sxy ÷ Sxx = 2
4. Intercept a = $\bar{y} - b \times \bar{x} = 6 - (2) \times 3 = 0$

Q18 **₹432 crore**

1. Users = 10% × 1,20,00,000 = 12,00,000
2. Orders per month = 12,00,000 × 3 = 36,00,000
3. Value per month = 36,00,000 × ₹100 = ₹36,00,00,000
4. Per year = × 12 = ₹4,32,00,00,000 = ₹432 crore
5. In an interview, state each assumption aloud, round sensibly, and sanity-check against something you know.

Q19 **900 units**

1. Contribution per unit = ₹150 − ₹110 = ₹40
2. Break-even units = fixed costs ÷ contribution = ₹36,000 ÷ ₹40 = 900

Q20 **B wins in both audiences (95% vs 90%, 22.5% vs 20%), yet A looks better overall (66.7% vs 26%)**

1. Audience 1: A = 90/100 = 90%, B = 19/20 = 95%
2. Audience 2: A = 10/50 = 20%, B = 90/400 = 22.5%
3. Overall: A = 100/150 = 66.7%, B = 109/420 = 26%
4. This is Simpson's paradox: the groups are very different sizes for each variant, so the overall rate is dominated by the easy audience. Compare within groups when the mix differs.

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