RANRA Study Tips

Public Health Specialty Training -- Numerical Reasoning Appraisal

The RANRA is not a maths test -- it is a decision-making test that uses numbers. The arithmetic rarely goes beyond GCSE level. What trips people up is logic, certainty, and time. Roughly 40 minutes for both sections -- under a minute per question.

Section 1 -- Comparison of Quantities

Options: A (Quantity A greater) | B (Quantity B greater) | C (equal) | D (cannot be determined)

Trap 1.1

Forgetting that D exists -- the most common error

Candidates fall into an A/B/C rhythm and force a comparison even when a variable is unbounded. If you cannot pin a variable to a range that forces one outcome, the answer is D.

e.g. A = x squared, B = x. If x=2: A>B. If x=0.5: A<B. Outcome flips -- D.

Trap 1.2

Unit mismatch

Quantities are sometimes in different units to catch quick readers. Always convert before comparing.

e.g. A = 2.4 km, B = 2,300 m. Wrong: 2,300 > 2.4 -- B. Right: A = 2,400 m > B -- A.

Rule: Watch for: pound/dollar, thousands/millions, km/miles, kg/lb, hours/minutes.

Trap 1.3

Percentage changes multiply -- they don't add

Successive percentage changes do not cancel symmetrically.

e.g. Price rises 20% then falls 20%. Wrong: +20-20=0, equal -- C. Right: 100x1.2=120x0.8=96. A>B.

Rule: A 50% rise followed by a 50% fall leaves you at 75% of original.

Trap 1.4

Sign blindness -- negatives and zero

Most intuitions only hold for positive numbers. Always test a negative case and a zero case before locking in.

e.g. Given x>y. A=x squared, B=y squared. If x=1, y=-3: x>y but x squared=1 < y squared=9 -- D.

Trap 1.5

Average of averages

The average of two group averages is NOT the overall average unless group sizes are equal.

e.g. 30 pupils avg 60%, 10 pupils avg 80%. Wrong: (60+80)/2=70. Right: (1800+800)/40=65.

Rule: Weight by the size of each group.

Trap 1.6

Doing arithmetic you don't need

Look for structure and shared factors before computing.

e.g. A=23% of 480, B=48% of 230. 23x480 = 48x230 = 11,040. Equal -- C. No long multiplication needed.

Section 2 -- Sufficiency of Information

Options: A (1 alone) | B (2 alone) | C (both together) | D (each alone) | E (neither sufficient) Memoraise these five options cold before the test.

Trap 2.1

Solving instead of checking

You don't need the answer -- only whether each statement forces a unique answer.

e.g. What is x+y? (1) x=6, (2) x+y=10. Statement 1 gives only x, y is free -- not sufficient. Statement 2 gives x+y directly -- B.

Trap 2.2

Carrying statement 1 into statement 2 -- the most common error

Once you read statement 1 it stays in your head. You must wipe the slate clean before evaluating statement 2.

Rule: Evaluate (1) alone. Then (2) alone. Only then consider together -- and only if both alone were insufficient.

Trap 2.3

Sufficient does not mean true

A statement can be accurate and still leave the answer undetermined.

e.g. Is x positive? (1) x squared = 9. True -- but x could be 3 or -3. Two possible answers -- not sufficient.

Trap 2.4

Narrowed but not pinned down

Reducing possibilities from infinite to two still is not sufficient. Sufficient means exactly one answer.

e.g. What is x? (1) x squared - 5x + 6 = 0. Solutions: x=2 or x=3. Two answers -- not sufficient.

Trap 2.5

Illegal cancellation hides a solution

Dividing both sides by a variable assumes it is non-zero. If it could be zero, you've thrown away a valid answer.

e.g. Is x=5? (1) x squared = 5x. Wrong: divide by x -- x=5. Right: x(x-5)=0 -- x=0 or x=5 -- not sufficient.

The Meta-Principle

For every answer you choose, try to break it. High scorers pick the answer that survives an attempted disproof. Ask: Have I tried a negative number? Have I tried zero? Have I tried a fraction between 0 and 1? A very large number? If 15 seconds of disproof yields nothing, lock in and move on. If you find a counterexample, your answer was wrong.