# Investment Banking Brainteasers





We often hear this question about brainteasers: "How important is the ability to make quick calculations and solve brainteasers in investment banking interviews, relative to other portions of the interview?" Simply said, "How important are brainteasers?" Brainteasers are not a major part of the interview process compared to your performance on the other parts, but they are useful for the interviewers for the following reasons:

**1) Another test of analytical ability**

Banks will test you in multiple ways, but sometimes, when they have to make the choice between several very good candidates, they will ask brainteasers to see who can do better.

**2) Brainteasers demonstrate your ability to handle strong pressure**

This is in fact the main purpose of a brainteaser. Bankers will often throw a question out of the blue, saying "What is 49 x 22" or "How many smaller cubes are in a 10 x 10 cube?" just to see how you react. Some people totally lose their concentration in such stressful situation even though they can be brilliant during exams or at online tests.Brainteasers can tell the difference. Good bankers need to be able to think clearly in stressful situations, so be ready.

**3) They test your ability to structure your thoughts**

With brainteasers, the best way is to tackle them step-by-step, with a clear logic in mind. Some people get confused and excited, and even though they may get to the final answer, they will look poorly organised and this will be weighted negatively. So how to handle brainteasers? The best way is to go step-by-step, slowly. Don't try to answer within five seconds. It is fine to say, "Please give me 30 seconds to organise my thoughts" and think through it." The speed of your answer is the not the key; the key is the way you structure your answer. Also, investment bankers do not try to be mean or harsh by asking tough questions, they are just testing your reactions. Remember that they were in your shoes before, so relax.

**Look at a few examples of brainteaser categories:**

Arithmetic Brainteasers

"If you add all the numbers from 1 to 100, what number do you get?" It's clearly impossible to add the numbers one by one, so you know that there is a trick here. If the question sounds impossible, take some time to think and to try to find the trick - there is always a trick! The trick here is to think that the numbers from 1 to 100 can come in pairs that add up to 100. For example: 1 +99 = 100, then 2 + 98 = 100, etc, until you reach 49 + 51 = 100 and then you have 50 left on its own. Think about how many pairs there are. There are 49 pairs, plus the 100 left alone, and the 50 in the middle left alone. So 50 x 100 = 5,000 + 50 = 5,050. That's your answer.Another one: "what is 49 x 63?" The best way is to use easy numbers. 49 x 63 is in reality equal to 50 x 63 minus 63. 50 x 63 = 100 x 63 / 2 = 6,300/2 = 3,150. Deduct 63 from 3,150 = 3,087. You can use this "breakdown" method for almost every calculation. Even if you are not good at maths, you can still solve it easily this way.

Logic Brainteasers

"If it is 3:30pm, what is the angle formed in the clock between the minute hand and the hour hand?"Similarly, this is all about breaking down the problem and being careful. The answer is not 90 degrees; that would be too easy. Remember that the hour arm will also move as the minutes pass. The clock is a 360-degree circle. So every hour, the hour hand will move by 360/12 = 30 degrees. In half an hour, it will therefore move 15 degrees. Therefore the angle between the minute and hour arm will be 90 degrees minus the 15 degrees, or 75 degrees.

Other Questions

These may include the "jugs of water" questions such as, "You've got a four-liter jug and a nine-liter jug. You've got a pool of water. What are the fewest number of steps required to come up with exactly six liters of water?" I also have had the "pizza" question quite a lot, such as "How many cuts do I need to get exactly 16 equally-sized slices of pizza?" A very important point to note is that banker will very, very rarely come up with their own brainteasers, unless you come across a particularly nasty one! That means that they will usually Google a couple and change the data a bit, sometimes not changing the data at all! So the best advice we can give you is to practice a few of them by going through a Google search, and you should be ready. Remember, the most important part of the interview remains on personality and motivation.

**Where do I find more practice?**

You can take a look at our investment banking technical guide, which has an extensive section on brainteasers that you would typically get in investment banking interviews.There are also a few cheap brainteaser guides on Amazon, and we recommend the one below (although not specific to investment banking):

**A few more free brainteasers for your practice:**

How many disposable nappies were sold in the UK last year? (Estimation question)

How many times in a day are the hands of a clock at right angles? (Answer: 44)

How many numbers between 1 and 1,000 contain the digit 5 at least once (Answer: Think of how many numbers from 1 to 1,000 do not have any 5's at all. This means that there are 9 possibilities for digits in the units, tens and hundreds place, or 9x9x9 = 729. So answer is 1000 - 729 = 271)

A car drives from point X to point Y, a distance of 60 miles, at an average speed of 30 mph. How fast would the car have to drive on the return leg from Y to X in order to average 60 mph over the entire journey? (Answer: not possible as one-way journey has already taken 2 hours. For average speed over entire journey to be 60mph, the total journey would need to be completed in 2 hours.)

You have 5 pots of coins. One of the pots contains only fake coins. The normal coins weigh 10 grams. The fake coins weigh 9 grams. You are given a weighing machine (one you would use to weigh yourself, not a balancing scales) and allowed to make only one measurement. How do you determine which pot contains the fake coins? (Answer: Take 1 coin for pot 1, 2 coins from pot 2, and so on and measure. The difference between the total weight and 150 will be the answer, e.g. if the weight is 143, then pot 7 is the one with fakes.)

At 3:30 pm what is the angle between the hands of a clock? (Answer: 90 - 30/2 = 75 degrees)