Part 6

You are going to read a newspaper article about maths. Seven paragraphs have been removed from the article. Choose from the paragraphs **A–H** the one which fits each gap (**37–43**). There is one extra paragraph which you do not need to use. Mark your answers **on the separate answer sheet**.

The man who proved that everyone is good at Maths

The French academic Marc Chemillier has shown that humans have remarkable innate skills with numbers. Reporter Alex Duval Smith accompanies him to Madagascar to see this at first hand.

Maths is simple. But to discover this requires travelling to the ends of the earth where an illiterate, tobacco-chewing teller lives in a room with a double bed and a beehive. As the sun rises over the hut belonging to Raoke, a 70-year-old witch doctor, a highly pitched din heralds bee rush hour. The insects he keeps shuttle madly in and out through the window. This bizarre setting, near nowhere in the harsh cactus savannah of southern Madagascar, is where a leading French academic, Marc Chemillier, has achieved an extraordinary pairing of modern mathematics and illiterate intuition.

37	

Mr Chemillier argues in this ground-breaking work that children should be encouraged to do maths before they learn to read and write. 'There is a strong link between counting and the number of fingers on our hands. Maths becomes complicated only when you abandon basic measures in nature, like the foot or the inch, or even the acre, which is the area that two bulls can plough in a day.'

38	

With a low table covered in pieces of wood – each of which has a particular medicinal virtue – Raoke sits on his straw mat and chants as he runs his fingers through a bag of shiny, dark brown tree seeds. 'There were about 600 seeds in the bag to begin with but I have lost a few,' he says. 'They come from the fane tree and were selected for me many years ago. The fane from the valley of Tsivoanino produces some seeds that lie and others that tell the truth so it is very important to test each seed. I paid a specialist to do that,' says the father of six.

39	

From this selection of wood pieces before him, Raoke can mix concoctions to cure ailments, banish evil spirits and restore friendships. A basic session with the seeds costs 10,000 *ariary* (£3), then a price is discussed for the cure. It seems there is nothing Raoke cannot achieve for the top price of one or two *zebus* – Malagasy beef cattle that cost about £300 each – though some remedies are available for the price of a sheep.

40	

Given the thousands of plant species in Madagascar that are still undiscovered by mainstream medicine, it is entirely possible that Raoke holds the key to several miracle cures. But Mr Chemillier is not interested in the pharmacopaeic aspect of the fortune teller's work.

41	

The startling reality of the situation is explained to me. Raoke can produce 65,536 grids with his seeds – Mr Chemillier has them all in his computer now. 'But we still need to do more work to understand his mental capacity for obtaining the combinations of single seeds and pairs,' he says.

42	

Over the years, Mr Chemillier has earned respect from Raoke and other Malagasy fortune tellers. 'Initially they thought France had sent me to steal their work in an attempt to become the world's most powerful fortune teller. But once I was able to share grids with them that had been through my computer program, we established a relationship of trust,' says Mr Chemillier.

43	

When not consulting clients, the diminutive fortune teller spends hours with his seeds, laying them in different formations and copying the dots down in pencil. Those grids have value and Raoke sells them to other fortune tellers. He is indeed a most remarkable man, and the full value of his work is, one suspects, something that even Chemillier may take years to fathom.

LIVEWORKSHEETS

A This is indeed impressive. The way in which Raoke poses questions over the seeds requires the same faculties for mental speculation as might be displayed by a winner of the Fields Medal, which is the top award any mathematician can aspire to, according to Mr Chemillier.

B Indeed, I can see it is the lack of memory and computer aids that helps keep Raoke's mind sharp. In the developed world people are over-reliant on calculators, dictionaries, documents. And also the developed world is wrong to ignore the basic human connection with numbers that goes back to using the fingers on your hands and relating them to the environment around you.

C In his book, *Les Mathématiques Naturelles*, the director of studies at EHESS (School for Advanced Studies in Social Sciences) argues that mathematics is not only simple, it is 'rooted in human, sensorial intuition'. And he believes that Madagascar's population, which remains relatively untouched by outside influences, can help him to prove this.

D 'A white man came from Réunion with a stomach ailment that the hospitals in France could not cure. I gave him a powder to drink in a liquid. He vomited and then he was cured,' says Raoke.

E Raoke duly felt able to reveal that a divine power shows him how to position the seeds. He does not understand why 'Monsieur Marc', and now this other visiting white person, keeps asking him why he lays the seeds in a certain way. Yet it is clear from a stack of grimy copybooks he keeps under his bed that he is kept very busy indeed as a receiver of divine messages.

F To make his point, Mr Chemillier chose to charge up his laptop computer, leave Paris and do the rounds of fortune tellers on the Indian Ocean island because its uninfluenced natural biodiversity also extends to its human population. Divinatory geomancy – reading random patterns, or *sikidy* to use the local word – is what Raoke does, when not attending to his insects.

G He is, after all, a mathematician, not a scientist. 'Raoke is an expert in a reflexive view of maths of which we have lost sight in the West,' he says. 'Even armed with my computer program, I do not fully comprehend Raoke's capacities for mental arithmetic.'

H Raoke proceeds from explanation to demonstration, pouring a random number on to his mat, then picking them up singly or in twos and laying them in a grid from right to left. Each horizontal gridline has a name – son, livestock, woman or enemy – and each vertical one has a name, too: chief, *zebu* (cattle), brother and earth. Whether one or two seeds lie at the intersection of two gridlines determines the subject's fortune and informs Raoke as to the cure required, and its price.

LIVEWORKSHEETS

Part 7

You are going to read a newspaper which reviews some graphic novels, books in which the story is conveyed to the reader through drawings. For questions **44–53**, choose from the sections (**A–E**). The sections may be chosen more than once. Mark your answers **on the separate answer sheet**.

Which section

mentions individual bits of a work being better than the overall effect it has on the reader?	**44**	
mentions an author improving on an earlier weakness?	**45**	
suggests that an author's newest work is as good as their previous one?	**46**	
mentions the confusion of a main character in a world which lacks stability and permanence?	**47**	
mentions the possibility that graphic novel authors are influenced by a desire to give readers what they expect?	**48**	
suggests that the hurried, imperfect look of an author's drawings is a deliberate effect?	**49**	
contains a suggestion that a work is more complex than its author claims?	**50**	
mentions those familiar with the genre experiencing a mixed reaction?	**51**	
contains a suggestion that the unoriginal nature of a work's central theme may be a problem?	**52**	
mentions images from a character's past serving as a visual symbol for what is happening in the present?	**53**	

LIVEWORKSHEETS

Where the novel meets the comic magazine

A The recent blockbuster film *Inception*, written and directed by Christopher Nolan, concludes with a 45-minute setpiece in which Leonardo DiCaprio's team of brain-hopping idea thieves descends through nested dreams, in each of which time runs more slowly than in any previous layer. Any graphic novel fans in the audience would have watched this complex sequence with nods of recognition. But perhaps with sighs of exasperation too: the film's showpiece effect – creating the illusion of relative time, of events happening simultaneously but being experienced at different paces – is much easier to achieve in the world of graphic novels. Years of experimentation, combined with certain defining features of the form, have resulted in a complex medium that excels at portraying multiple time schemes and shifting conceptions of reality. Three new works bear testimony to this.

B *Air* by G Willow Wilson is a love story in a breathless narrative of industrial espionage. Its protagonist, Blythe, is plunged into a world of dizzy reversals, in which the only constant is the philosophical notion that by redrawing our impressions of the world we can remake it for ourselves. Character and motivation are almost absent as Wilson's hapless heroine is dragged from pillar to post by an arbitrary narrative fuelled by fitful quips. More seriously, the layout and structure show a distinct lack of invention. Just as hope is flagging, however, Wilson pulls out of the dive, and *Air* becomes both stranger and more interesting in concept and execution. One extended chapter consists of a sequence of flashbacks in a plane diving towards the ground, as Blythe finds herself simultaneously inhabiting the memories of her lover. Drawings of a falling, entwined couple are interleaved with the panels, a kind of metaphor for the movements of the plane.

C Matt Kindt's graphic novel *Revolver* is an interesting addition to the genre in that it works around a single, but effective, manipulation of narrative time. Each morning its protagonist Sam finds himself waking up either in his everyday life, in which he edits pictures for a newspaper, or in an America under siege, where he is forced to fight for his life. Drawn by its author in a scrappy, offhand style that belies a deft grasp of form and scenic arrangement, Kindt's novel still ultimately feels like less than the sum of its parts. Although attractively realised, the basic set-up, in which the audience is encouraged to wonder whether a troubled man is hallucinating or not, is becoming something of a familiar trope after *Fight Club*, *Memento* and others. Where *Revolver* succeeds is in the quiet suggestiveness with which his arrangement of panels blurs our perspective on the action.

D Last, and strangest, is Charles Burns's *X'ed Out*, the first of a projected series of graphic novels by this idiosyncratic writer-illustrator. Burns is revered in comic circles for *Black Hole*, a surrealist saga. Grotesque but compelling, Burns's drawings told the story of a group of teens who contract a disease that turns them into mutants and social outcasts. The author's subsequent contention that the book was a metaphor for adolescence came nowhere near to explaining the work's dark and haunting depths. *X'ed Out* is designed in full colour but its seamless and troubling transitions between its teenage protagonist's dreams and waking moments show that Burns has lost none of his touch. He withholds many of the traditional devices used within the genre to shape a reader's idea of time and causality, such as sound effects, motion blurs, panel comments and the like. The effect is highly unsettling.

E Graphic novels are good at representing complicated sequences in time, and contemporary creators seem particularly interested in constructing stories that place this at the centre. We can posit reasons – pandering to popular clichés of 'comic-book' entertainment, generalised discontent with Hollywood five-act stories, or simple celebration of a medium so suited to non-straightforward entertainment. Whatever its origin, a complex interest in time extends throughout the medium. Even the latest addition to the new Batman series, written by Grant Morrison, skips wildly across the epochs of human history, following a Caped Crusader who has come adrift in time. As the medium continues to evolve, this abiding formal interest in a largely unconscious process of perception may come to seem its most defining feature.

LIVEWORKSHEETS