

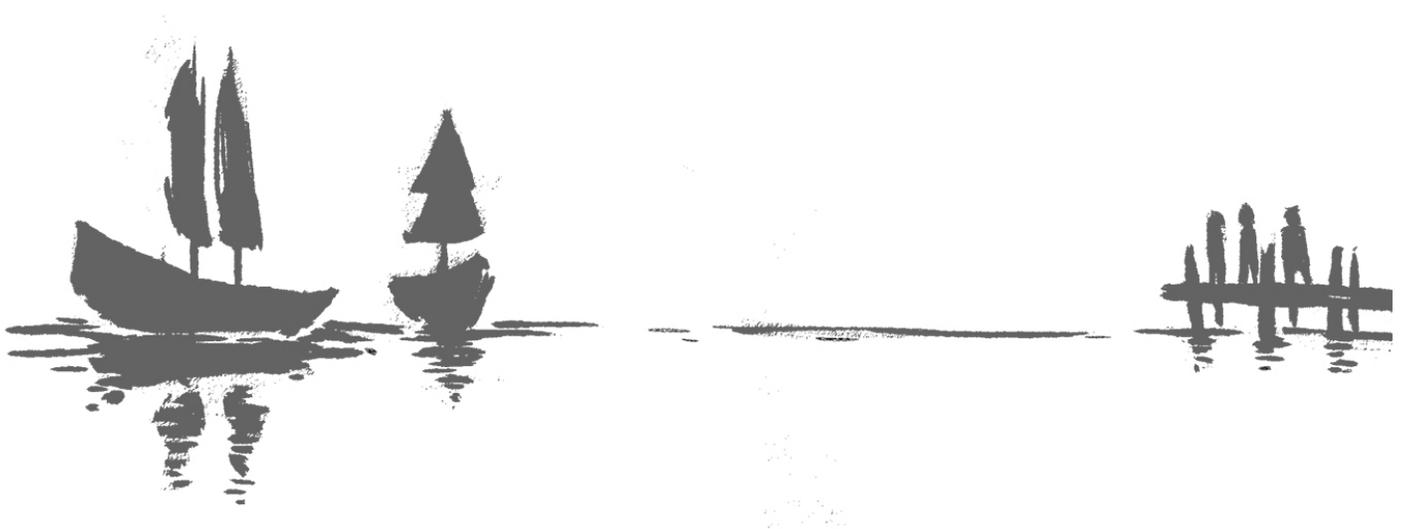
Lumparland Harbor

The Arithmetiquities // Chapter I

Though it is still before sunrise, Lumparland Harbor is already bustling. Sailing ships moor at the misty docks, bringing travelers and goods to the seaside town. Three dwarves disembark from different ships, each adventurer returning home from some faraway locale. The three women gather at the end of the pier.

The strangers discover that they all live along the main road that leads from the harbor, so they decide to split the cost of a wagon.* **Egga** lives 10 miles away, **Flora** lives 20 miles away, and **Greta** lives 30 miles away. The wagon ride costs \$1.50 per mile regardless of the number of passengers.

How much should each of the adventurers pay so that each one has a fair fare?



Epilogue. During the wagon ride, the trio compares stories of their far-flung adventures. The warriors decide to form a team and are thereafter known as the **Dwarven Shieldmaidens of Lumparland**. Over time, their reputation spreads across the land of Sfera, where it eventually reaches the ears of a wise, old wizard who is seeking brave souls for an important quest...

* Lumparland was the first region in Sfera to offer ride-sharing through the horse-drawn wagon service, Wyft.

Enchanted Archives

The Arithmetiquities // Chapter II

The Twilight Tower stands on a rocky bluff overlooking the rolling hills below. Inside, the wizard **L3mm0nsc8 the Infinite** combs through his archive of magical books. He seeks insight about how to defeat a dark sorcerer bent on world domination. For a while, he floats up and down the maze of bookshelves, unsure of where to begin. He eventually decides to narrow his search using the following procedure.

L3mm0nsc8 begins by moving all of his books to the first shelf of his enchanted bookcase.* From the first shelf, he pulls five books at a time. He divines the most promising book and moves it to the second shelf, putting the other four on an enchanted cart for later re-shelving. He continues this process until there are fewer than five books left on the first shelf.

He then turns his attention to the second shelf of the bookcase. From here he takes books five at a time, putting the most promising book on the third shelf and the other four on the cart. This continues until there are fewer than five books on the second shelf.

He then continues the process with the books on the third shelf, transferring one book out of five to the fourth shelf and putting the others on the cart. The whole enterprise continues from shelf to shelf until there are fewer than five books on the last shelf.

In the end, L3mm0nsc8 is left with a total of nine books in the bookcase: two books on the first shelf, four on the second shelf, none on the third shelf, and three on the fourth shelf.

How many books are in L3mm0nsc8's archive?



Epilogue. The wizard's arcane sorting exercise works perfectly. The nine books that remain describe a set of powerful mathematical artifacts, the **Arithmetiquities**. L3mm0nsc8 knows that these ancient items must be the objects of his quest, and he knows he won't be able to find them alone...

* You may be asking yourself, "How big is this bookcase?" The answer is that an enchanted bookcase is always as big as it needs to be, with shelves as long and as numerous as is necessary to hold the books that are in it. A wizard's library is a complicated and unusual place.

Road to Mudpatch

The Arithmetiquities // Chapter III

The human girl **Astrid** and her trusty horse **Lothar** are riding along the road to Mudpatch when they come upon a group of travelers in need of help.

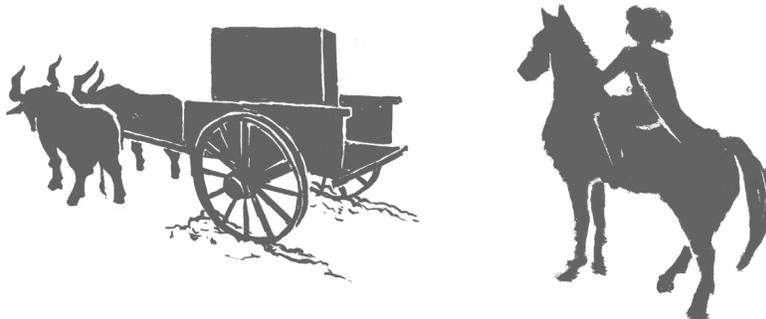
A stonemason had been transporting a heavy block of marble – 1400 pounds! – when his cart had gotten stuck in the mud. A pair of ox riders had stopped to help, but weren't sure that they could.

The ox riders report that one large ox could not, by itself, pull that much weight; neither could two medium oxen working together; nor could three small oxen. But, they say, one large ox and one medium ox working together could pull that much weight, as could two medium oxen and one small ox, or three small oxen and one large ox.* Unfortunately, the two ox riders are astride one large ox and one small ox.

Astrid listens to their reports and, after thinking for a few moments, announces: "I know Lothar's strength quite well. If he works alongside your two oxen, the team will have just enough strength to pull the cart!"

Working together, the three animals are able to pull the cart free of the mud. The whole group continues together along the road to Mudpatch and, in celebration, shares a meal at the Skunk and Pumpkin Inn.

How much can each animal (a large ox, an medium ox, a small ox, and Lothar the horse) pull on its own?



Epilogue. From a neighboring table at the inn, L3mm0nsc8 overhears the story of Astrid and Lothar. Impressed by their clever thinking and willingness to help others in need, the wizard floats over to Astrid's table and offers to buy her a bowl of the inn's namesake stew...

* Ox riders are known for their encyclopedic knowledge of ox-related topics.

Skunk & Pumpkin Inn

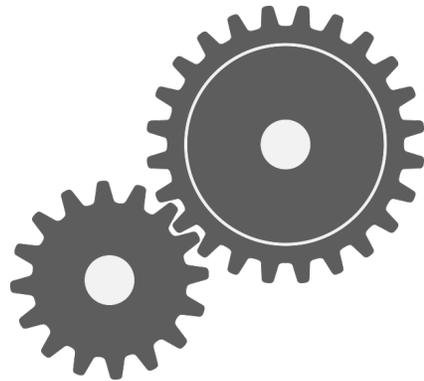
The Arithmetiquities // Chapter IV

A consummate foodie and tinkerer, **Dennis, the halfling of Mudpatch**, is proprietor of the Skunk & Pumpkin Inn. He is always busy in the kitchen (where he is head chef) and workshop (where he is head of facilities and maintenance).

Certain that a bit of engineering will come in handy against a dark sorcerer, the wizard L3mm0nsc8 hopes that Dennis will join the team. L3mm0nsc8 finds Dennis in the workshop, where he is attempting to redesign the gears of an egg-beater for greater torque.*

The egg-beater's two gears are shown here in their starting positions. The larger gear (to the right) is attached to a hand crank and turns clockwise, causing the smaller gear to turn counter-clockwise at a different rate.

What is the minimum number of rotations the larger gear must make to return both gears to their starting positions? If the larger gear makes 90 complete rotations in one minute, how many rotations will the smaller gear make in one minute?



Epilogue. L3mm0nsc8 introduces Astrid and Dennis to one another, and the three discuss the task ahead. The wick of their oil lamp suddenly flickers as the door opens, and a tall, slender figure strides in. The room is silent until L3mm0nsc8 speaks. “Well, well,” the wizard says with a smile of recognition. “If it isn’t the Whiz of the Woods...”

* “Torque” is a twisting force that causes an object to rotate, and a gear is a kind of simple machine based on the wheel and axle. Gears of different sizes can be used to create a compound machine, called a “gear train”, that magnifies an input force to create a more powerful output force. Dennis learned all about this when he was a student at the Bramblewine Academy.

Whiz of the Woods

The Arithmetiquities // Chapter V

Years ago at the Sherwood Shootout archery competition, archers from across Sfera congregated to once and for all bestow the title of “Whiz of the Woods” on the best marks-person.* Among the contestants was the elf ranger **Xabier**.

In the first round of the competition, contestants took 10 shots from close range. Xabier hit the bullseye on 100% of their shots in the first round. Xabier hit the bullseye on 95% of their shots in the second round, where contestants took 20 shots from medium range. The third round was the long-range round. Xabier took 30 shots and hit the bullseye 90% of the time.

What percent of Xabier’s shots hit the bullseye?



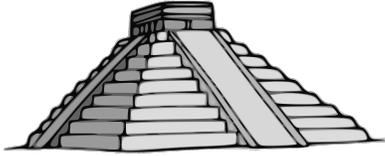
Epilogue. L3mm0nsc8 had been watching from the bleachers that day, and after Xabier claimed the first-place trophy (not to mention the coveted title), the wizard approached the elf. Although the quest for the Arithmetiquities was still long years away, Xabier agreed to ally with L3mm0nsc8. Thus, Xabier became the first official member of the **Fellowship of the Twilight Tower...**

* The Sherwood Shootout was the first archery competition in Sfera to adopt completely gender-free terminology. This was greatly appreciated by many contestants, including Xabier, a nonbinary elf whose pronouns are they/them.

Sinister Ziggurat

The Arithmetiquities // Chapter VI

A shadow passes over the arid landscape. Scrubland-dwellers scurry to avoid the gaze of the flying beast and its rider. **Obb3lus the Undefined**, dark sorcerer, returns to his Sinister Ziggurat* astride his fearsome wyvern, Skkraaa**.



* A ziggurat is massive pyramid-like building with successively receding levels. (Note: this illustration is *not* of Obb3lus's Sinister Ziggurat, which is much more sinister.)



** A wyvern is a winged, two-legged dragon with a barbed tail. (Note: this illustration is *not* of Obb3lus's fearsome wyvern, which is much more fearsome.)

Skkraaa lands in her nest on the middle level of the ziggurat. Obb3lus dismounts and immediately goes up three levels to the laboratory where he drops off the potion supplies he bought at HexMart.

Obb3lus then goes down five levels to the nursery where he feeds the gremlins. Then he goes up six levels to the map room where he spends several hours planning world domination at the hands of his gremlin army.

Just before bed, he goes down ten levels to the ground floor of the ziggurat where he double-checks that the entry portcullis is locked for the night.

Finally, he goes to the top floor, polishes the lenses on the telescope in the observatory, and crawls into his sarcophagus for a nap.

How many levels does the Sinister Ziggurat have?



Epilogue. Meanwhile, miles away, a group of heavily-armed warriors is converging on the Skunk and Pumpkin Inn...

Midnight Oil

The Arithmetiquities // Chapter VII

When Egga, Floora, and Greeta, the Dwarven Shieldmaidens of Lumpharland, burst through the doors of the Skunk and Pumpkin Inn, L3mm0nsc8 lets out a triumphant roar. “Now we are complete!” Working by lamp-light into the wee hours of the morning, the newly-assembled Fellowship of the Twilight Tower holds their first strategy meeting.

At the start of the meeting, Dennis fills a lamp with olive oil and lights it.* Hours later, Astrid notices that the lamp is half empty, and refills it to the top with mustard oil.

Later, when the lamp is half empty again, Xabier fills it to the top with olive oil.

Later still, at the end of the meeting, Egga extinguishes the lamp and sees that it is half empty again. She fills it to the top with mustard oil.

When Egga is done, what percent of the oil in the lamp is olive oil?



Epilogue. By the end of their meeting, the members of the Fellowship have devised a plan and divided up the tasks. As a bright morning sun rises in the sky, the adventurers part company, each ready to make their contribution to finding the lost **Arithmetiquities**...

* It may seem funny to think of olive oil as a fuel source, since normally it is used in things like salad dressing. In fact, olive oil has many non-culinary uses: you can use it to soothe sunburns and diaper rash, make soap, or stop a door hinge from squeaking. You can even use it to shine your shoes! Plus, after that, your shoes will be absolutely delicious.

Weapon Swap

The Arithmetiquities // Chapter VIII

At their initial strategy meeting, the Fellowship decided that Egga, Floora, and Greeta should seek out the **Golden Rectangle** in the mountains surrounding wintry Yälä Peak. In preparation for their quest, they trade out various weaponry at a local swap meet.*

When she arrived at the swap meet, the ratio of swords to bear traps in Egga's bag was 1 : 2. After a day of trading she had given away six bear traps (in exchange for a sweet pair of titanium nunchucks), but she had the same number of swords. The ratio of swords to bear traps is now 3 : 5. How many of each weapon were in Egga's bag initially?

At the start of the day, the ratio of halberds to hatchets in Floora's crate was 4 : 9. She didn't gain or lose any hatchets, but she acquired ten new halberds (which she traded for a set of old jousting equipment she didn't use any more). The ratio of halberds to hatchets is now 2 : 3. How many of each weapon were in Floora's crate initially?

Greeta arrived at the swap meet with daggers and throwing stars in the ratio 5 : 7. After gaining ten extra daggers in exchange for giving away two (exceedingly sharp) throwing stars, this ratio became 5 : 6. How many of each weapon did Greeta have initially?



Epilogue. Armed to the teeth and ready for anything, the shieldmaidens venture into the frozen tundra...

* Weapon swaps are very popular among gladiators, soldiers, bounty hunters, mercenaries, and warriors of all types. After all, who wants to swing the same old battle axe day in and day out?

Frogfolk of Anura

The Arithmetiquities // Chapter IX

Since a horse can cover long distances with relative ease, the Fellowship decided at their first strategy meeting that Astrid and Lothar should seek the lost **Sieve of Eratosthenes**. The pair follows the wide, slow-moving Anura River. Astrid is hopeful that the frogfolk, inhabitants of the river's marshy delta, may be able to provide her with a lead.

In the fishing village of Rana, Astrid hears rumors that there once existed a treasure map detailing the Sieve's location. None of the frogfolk in Rana know any details about where it might be found, however, so Astrid and Lothar board a ferry bound for Bufo, the village across the river.

While aboard the ferry from Rana to Bufo, Astrid observes a second ferry traveling in the opposite direction. Fifty villagers ride on the Bufo-bound ferry, and the ratio of frogfolk to toadfolk on this ferry is 2 to 3. The ratio of frogfolk on the Bufo-bound ferry to frogfolk on the Rana-bound ferry is 5 to 6, while the ratio of toadfolk on the Rana-bound ferry to frogfolk on that ferry is 7 to 8.

What is the total number of passengers aboard the two ferries?



Epilogue. In Bufo, Astrid and Lothar get a tip that their best bet may be to inquire with Oogox, a notorious collector and packrat* who owns the junkyard in the village of Kiri. They continue their journey downstream, unaware that their inquiries about the Sieve are drawing the attention of some rather unsavory characters...

* Strictly speaking, a frogfolk packrat would be a "packfrog", but you get the idea.

Cayleywood

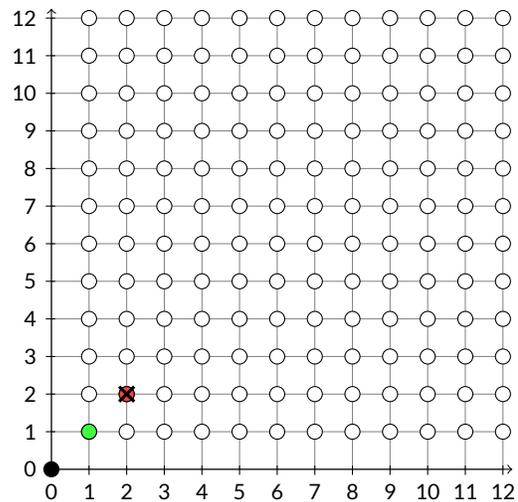
The Arithmetiquities // Chapter X

The Fellowship decided at their planning meeting that Dennis would pursue the **Roots of Unity**, rumored to grow at the base of the Counting Tree in the Cayleywood.

The Cayleywood is unusual because its trees grow in a square grid.* We can picture the forest as a coordinate plane, where trees grow only at points whose coordinates are positive integers.

When Dennis arrives in the Cayleywood, he notices something interesting: it's hard to see some of the trees, depending on where you're standing. For example, when standing at the origin, he can see the tree located at (1,1) but not the tree located at (2,2), since the former tree blocks his view of the latter.

Which trees can be seen from the origin? Which are hidden from view? What patterns do you notice? What do you wonder?



Epilogue. Before long, Dennis finds the famous Counting Tree and begins digging for the Roots of Unity. Barely has he begun to dig, however, when the guardian of the Roots is upon him, a flurry of catching claws and nasty, sharp, pointy teeth...

* Interestingly, there is no evidence to suggest that the trees were planted in a square grid. They appear simply to have grown in this configuration. Many important horticultural theories have been proposed for this phenomenon, the most popular of which is "there's something in the water."

Into the Grasslands

The Arithmetiquities // Chapter XI

At their first planning session, the Fellowship decided that, since Xabier is the stealthiest among them, they should pursue **Zeno's Arrow**. The Arrow was last known to be in the possession of Gorgath the Hateful, barbarian warlord of the Mindaro Grasslands.

The grasslands are home to all manner of exotic and dangerous creatures.* Xabier therefore creates green dye as grassland camouflage. To make one batch of green dye, Xabier would normally mix 2 cans of blue dye and 3 cans of yellow dye.

But, Xabier accidentally mixes the wrong shade of green by getting the recipe backwards: 3 cans of blue dye and 2 cans of yellow dye. Even worse, Xabier mixes up 12 batches of this erroneous recipe! Xabier has extra blue and yellow dye on hand, but doesn't want to waste any of the dye they have already mixed.

Devise a strategy that Xabier can use to turn all the wrong-shade-of-green dye to the right shade of green. Try to find a strategy that uses the smallest amount of additional dye.



Epilogue. Confident that they will be able to blend in with the landscape, Xabier begins the treacherous trek into the grasslands. Wild animals, however, don't rely on sight alone, and the fiercest predators can smell Xabier coming from a mile away...

* These include dangerous wild animals, in addition to the aforementioned barbarian horde.

Alpine Rescue

The Arithmetiquities // Chapter XII

Soon after entering the wintry terrain surrounding Yälä Peak,* the shieldmaidens discover that the mountain pass is blocked by snow.

Working as a team, the trio can shovel snow at the rate of 80 cubic yards for the first hour, 75 cubic yards for the second hour, 70 for the third, and so on, always shoveling five cubic yards less per hour than the previous hour.

If the pass is 12 feet wide, 90 feet long, and covered with snow 10 feet deep, how many hours will it take them to clear it?



Epilogue. Near the end of the pass, the warriors unearth (unsnow?) a huge, hairy foot. Flora, the most skilled of the group when it comes to wilderness first aid, detects a pulse. The three women free the beast, a yeti who introduces himself as **Lumimies**. He offers to make dinner for the shieldmaidens and let them shelter in his cave overnight. Warm, safe, and well-fed in Lumimies's cave, the shieldmaidens make an unexpected discovery among the cookbooks on the yeti's kitchen shelves...

* The tallest mountain in Sfera has attracted the attention and curiosity of adventurers for generations. Rumors abound about the various creatures that mountaineers claim to have seen living on, under, and around Yälä Peak: dragons, trolls, treeple, moomins, jackalopes, wookalars, and even the reclusive pignoot grump.

Oogox the Antiquarian

The Arithmetiquities // Chapter XIII

Amid teetering towers of trash, Astrid finds **Oogox** of the frogfolk, collector and antiquarian. Astrid presses Oogox to reveal what he knows about the location of the Sieve of Eratosthenes, suspicious that it may be hidden right here among all the broken and discarded junk.

Oogox plays dumb, so Astrid agrees to buy a few things to grease the wheels of conversation. She buys three items* from Oogox's junk pile for a total of \$10.50. She notices that one of the items costs three times another, and one of the items costs eight times another.

How much is the cheapest item? (Everything costs a whole number of cents! No half-pennies!)



Epilogue. Oogox admits that he did once have a map that may have been related to the Sieve of Eratosthenes, but it was stolen after a break-in at the junkyard. Just then, a group of burly frogfolk emerge from the marsh, armed with harpoons. They “request” that Astrid accompany them to meet with their boss, who feels Astrid has been asking too many questions about the Sieve...

* Though not even remotely important to the story, the three items that Astrid buys are a frying pan, a second-place bowling trophy, and a stuffed armadillo. Oogox has amassed quite an eclectic collection of junk.

Brunch Buffet

The Arithmetiquities // Chapter XIV

Dennis has met a significant adversary in **Rototasker**, the tempestuous, three-tailed squirrel who lives in the Counting Tree and guards the Roots of Unity. In addition to preventing the Roots from falling into the wrong hands,* Rototasker eats the Roots as his main food source. In compensation for Dennis's taking some Roots, therefore, Rototasker demands an elaborate feast.

For the first course, Rototasker wants a brunch buffet. In addition to sparkling orange juice and tiny squirrel-sized deviled eggs, Rototasker demands six coffee cakes: two cakes each of three different recipes!

Luckily, Dennis has many coffee cake recipes. The first recipe calls for $2\frac{1}{2}$ cups of flour, the second calls for $2\frac{3}{4}$ cups of flour, and the third calls for $3\frac{1}{3}$ cups of flour. Dennis has a 20-pound sack of flour, and estimates that one cup of flour weighs $\frac{3}{4}$ pound.

Does Dennis have enough flour to make all six coffee cakes? If so, how much flour will be left over? If not, how much more flour does he need?



Epilogue. Rototasker scarfs down the brunch buffet with delight. So much food disappears into the squirrel, in fact, that Dennis is left with questions about exactly how Rototasker's internal organs work! Dennis is preparing to take some of the Roots, when Rototasker stops him and asks what's on the dinner menu...

* Rototasker isn't exactly sure whose hands are the wrong hands and whose hands are the right hands. He is especially perplexed about this, since everyone he has met seems to have right hands.

Wildlife Encounter

The Arithmetiquities // Chapter XV

The Mindaro Grasslands are a dangerous place. For example, travelers must be wary of the geopard, a nimble predator with swift feet and spotted fur.*

A geopard is hunting in the grasslands when it spots Xabier 500 meters away. The geopard starts running in a straight line toward Xabier at top speed. When Xabier realizes a geopard is in pursuit, they begin running at their top speed away from the geopard, but in the same direction. Unfortunately, the geopard has had a 20 second head start!

Assume the top running speed of a geopard is 18 meters per second and Xabier's top running speed is 13 meters per second. How long after the geopard starts running will it catch Xabier?



Epilogue. The geopard reaches Xabier and pounces, knocking the elf to the ground. Xabier shields their face from swiping claws, but they feel lightheaded with shock and exhaustion. Just as they are about to pass out, they hear an explosion and see a cloud of purple smoke descending upon them. Then, all goes black...

* "Geopard" rhymes with "leopard".

Zombie Juice

The Arithmetiquities // Chapter XVI

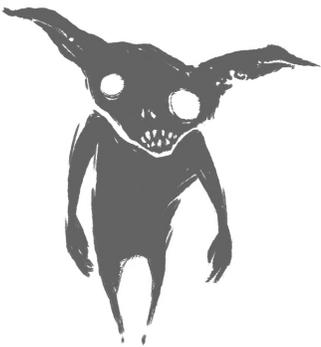
The dark sorcerer Obb3lus is raising an army of gremlins to do his bidding. Unsatisfied with a regular gremlin army, the power-hungry Obb3lus simultaneously begins experimenting with raising the dead.

His first recipe for Zombie Juice™ was made from a solution that is 10% wormwood extract and 90% soymilk.* He tests this potion on the gremlins and, unfortunately, discovers that the 10% solution is too weak. It does a fine job killing the test-gremlins, but it doesn't bring them back as zombie-gremlins. Not helpful.

In his second attempt, he mixes up a batch of 25% wormwood solution. This recipe is far too strong: so powerful that it kills the test-gremlins, brings them back as zombie-gremlins, and then immediately re-kills them. Also not helpful.

Obb3lus decides to try a batch of 15% wormwood solution, but he wants to use the leftovers from his earlier experiments. He has 30 liters of the 25% solution, and 75 liters of the 10% solution.

Devise a recipe that uses Obb3lus's supply of 10% wormwood solution and 25% wormwood solution to make a solution that is exactly 15% wormwood extract. What is the maximum amount of 15% solution that Obb3lus can create?



Epilogue. Obb3lus continues to tinker with his recipes until the gremlin zombification formula is exactly right. Unfortunately, this takes quite a toll (physically, psychologically, and emotionally) on the gremlin horde. Knowing that *esprit de corps* is an important part of any fighting unit, Obb3lus plans a way for the gremlins to blow off some steam...

* In the wild, gremlins consume an entirely vegan diet, so Obb3lus chose soy milk as the base liquid when making Zombie Juice. He tries to keep his gremlins as comfortable as possible in between his ghastly experiments. This may seem contradictory, but Obb3lus is a complex guy.

Cryptic Codex of Zethar the Druid

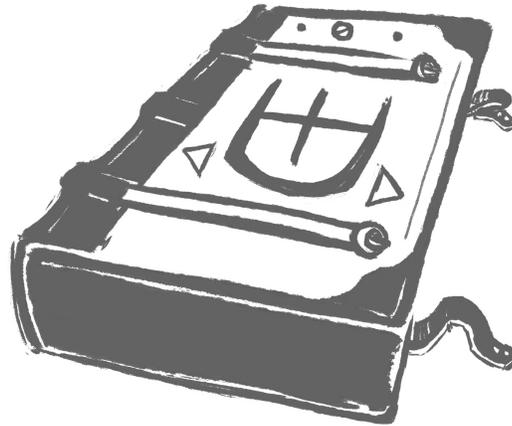
The Arithmetiquities // Chapter XVII

Lumimies the yeti has offered the dwarven shieldmaidens shelter inside his secluded cave in the shadow of wintry Yälä Peak. There, among the cookbooks on his kitchen shelves, they discover (what luck!) the Codex of Zethar the Druid.*

The Codex is said to reveal the location of a secluded shrine, the last known resting place of the Golden Rectangle. The book, however, is written in a cryptic code. To reveal the message, the shieldmaidens will have to decode all 760 pages of the ancient book.

The three warriors decide to split up the task, each decoding a section of the book. Egga will start on page 1, while Floora and Greeta will each start somewhere in the middle. Egga can decode one page in 20 seconds. Floora can decode one page in 45 seconds. Greeta can decode one page in 30 seconds.

Devise a method for splitting the Codex into three sections such that each of the three women works for the same amount of time. On what page should each of them start decoding? How long will it take them to decode the whole Codex?



Epilogue. Upon deciphering the book, the shieldmaidens learn the precise location of the shrine. Lumimies is familiar with the location described in the Codex, but refuses to take the shieldmaidens there, for it lies deep in the territory of a mountain-dweller that Lumimies has encountered before, and now wishes to avoid at all costs...

* The extant philosophical writings of Zethar the Druid are widely studied by scholars and include many impressive results (for example, his proof that all horses are the same color).

Boss Paroot

The Arithmetiquities // Chapter XVIII

Astrid and Lothar, having been captured by a group of harpoon-toting goons, are taken to the hideout of local crime lord **Boss Paroot**, also known as **The Durian**.*

Boss Paroot's network of spies and informants reported back to him that someone has been snooping around in search of the Sieve of Eratosthenes. Boss Paroot tells Astrid that he has valuable information about the Sieve's location but, of course, she'll have to earn it.

He challenges Astrid to a game of *wux*, a favorite frogfolk pastime. In *wux*, a *flox* is worth 2 points and a *brax* is worth 5 points. During the game, Astrid scores eight fewer floxes than Boss Paroot, but she scores five more braxes than he does. Together the two players score 93 points total.

What are their final scores? Who wins the game? Can we determine from this information exactly how many *wuxes* and *braxes* each played scores? Why or why not?



Epilogue. Boss Paroot praises Astrid for playing such a competitive game of *wux* (regardless of the outcome, which will not be revealed in this epilogue — because spoilers!). He agrees to share what he knows about the location of the Sieve. Paroot presents Astrid with a tattered piece of parchment, on which is drawn a faded treasure map...

* Boss Paroot earned this nickname because he's heavy, stinky, and has a spiky personality.

Sushi Sampler

The Arithmetiquities // Chapter XIX

Rototasker is one demanding rodent. He finishes an enormous brunch buffet, then immediately burdens Dennis with a new menu to plan. This time it's a sushi sampler for supper! The price lists shown below are for the three main grocers in Mudpatch.*

Which shop offers the best deal on each sushi item? In the interest of time, Dennis would like to do all of the shopping at a single store. Which store would you recommend and why?

	Humboldt's Sundries	The Ewer and Firkin	Ye Olde Foode Shoppe
Avocados	\$2.00 each	6 avocados for \$11.99	10 avocados for \$18.50
Cucumbers	\$0.99 each	6 cucumbers for \$4.99	2 cucumbers for \$1.89
Rice	2-pound bag \$5.60	\$2.88 per pound	4-pound bag \$11.50
Nori	pkg of 10 sheets \$3.45	pkg of 12 sheets 2 for \$8.40	pkg of 15 sheets \$5.22
Gari	6.7-oz jar \$3.66	8-oz jar \$4.24	12-oz jar \$6.84
Soy sauce	10-fl oz bottle \$1.99	20-fl oz bottle 3 for \$12.49	half-gallon jug \$11.99
Sesame seeds	3.75-oz bag \$6.08	half-oz bag \$16.72	4.5-oz bag 3 for \$17.91
Wasabi	1.5-ounce tube \$3.62	half-ounce tube \$1.30	1-ounce tube 4 for \$9.99
Salmon	4 pounds \$49.99	\$12.59 per pound	\$27.99 per kilogram



Epilogue. Not sated by the sushi sampler, the salivating squirrel suggests something sweet. Dennis, disheartened, decides to do what the diminutive devil demands...

* Given the epicurean nature of most halfings, it's easy to see why the Mudpatch grocery trade is such big business. In addition to the three general stores, there are countless smaller shops that sell specialty items — from the cheese craftsmen at “Custom Curds”, to the pickle purveyors at the “Gherkin Emporium”.

Cortaderia Jubata

The Arithmetiquities // Chapter XX

Xabier wakes up on a bed of grass, with various body parts wrapped in bandages. Shafts of sunlight filter through the thatched roof of the shelter, and in the warm glow Xabier sees an old woman grinding away with a mortar and pestle.

“Ah! You’re awake,” the old woman croaks as Xabier sits up. “That leopard almost got the better of you!” The woman identifies herself as **Cortaderia Jubata**, and she tells the story of how she had been gathering herbs when she saw the leopard chasing Xabier. “A bit of noise and some distracting smoke was enough to scare him off.”

Cortaderia, a wise naturalist who has long lived in the Mindaro Grasslands studying the flora and fauna,* knows just the right herbs to heal Xabier’s wounds. Plus, she knows how to befriend (or avoid) the wild animals.

When making her latest batch of purple-smoke grenades, Cortaderia had intended to use 50 ounces of black-berry juice in each grenade, but found she had 5 ounces less than she needed. Instead, she put 45 ounces of juice in each grenade and kept the remaining 95 ounces for later.

How many smoke grenades were in the batch?



Epilogue. Despite Cortaderia’s repeated admonishments that they rest, Xabier explains their impatience to get on with the quest for Xeno’s Arrow. Cortaderia, who knows all about the grasslands and their inhabitants, agrees to lead Xabier to the barbarian stronghold...

* “Flora and fauna” is a fancy way of saying “plants and animals”, of which there are many in the grasslands. Cortaderia has catalogued many of the living creatures. For instance, she has identified at least eight species of wegu, a sprinting lizard that runs on its hind legs, and even learned how to communicate with some of them.

Tenzig the Dancing Sherpa

The Arithmetiquities // Chapter XXI

After decrypting the no-longer-lost Codex of Zethar the Druid, the shieldmaidens discovered the location of the Shrine of the Golden Rectangle. Lumimies, the yeti, breaks the news that the Shrine is found within ice spider territory. He refuses to accompany the shieldmaidens because he was once bitten by an ice spider and discovered that he is allergic to them.*

However, Lumimies introduces the shieldmaidens to his friend: **Tenzig the dancing sherpa**, a skilled mountaineer (and dancer) who has led many groups to the summit of Yälä Peak.

Tenzig agrees to lead the treacherous expedition and devises a plan to remain vigilant of the ravenous arachnids who live among the windy passages.

The expedition includes ten people: Egga, Floora, and Greeta, along with Tenzig and six members of his mountaineering team (who are also his band). Two of the ten climbers stand guard each night while the others sleep. During the climb, every member of the group stands guard with each of the other members exactly once.

How many nights of sleep does Greeta get during the climb?



Epilogue. Despite a grueling climb, the mountaineering team eventually reaches the summit of Yälä Peak and locates the Shrine of the Golden Rectangle. Unfortunately, they arrive just moments behind another group that has also been seeking the Rectangle...

* A little-known fact about yeti biology: all yetis are allergic to ice spider venom. An unsurprising fact about ice spider biology: ice spiders are allergic to being stepped on by huge yeti feet. So, you see, nature has a way of balancing out in the end.

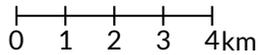
Treasure Map

The Arithmetiquities // Chapter XXII

Astrid beat Boss Paroot in a game of wux, and won a treasure map as her prize. The map shows the locations of the three main villages of the frogfolk. On the back is written a perplexing message.*

UIF TJFWF MJFT JO B DBWF BQQSPYJNBUFMZ TFWFO LJMPNFUFST GSPN SBOB,
FJHIU LJMPNFUFST GSPN CVGP, BOE OJOF BOE POF IBMG LJMPNFUFST GSPN LJSJ.

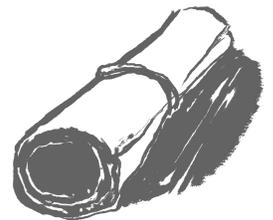
Where would you recommend Astrid start her search? Explain how you made your decision.



Rana
■

Bufo
■

Kiri
■



Epilogue. As Astrid departs Boss Paroot's hideout, the crime lord gives her a final word of warning: be cautious, for a ghostly guardian is rumored to be protecting the Sieve...

* Astrid can tell right away that the message isn't written in froggish, the native tongue of the frogfolk, because the words are too short. Words in the frog tongue are as long as frog tongues! She assumes, therefore, that the message is a letter-by-letter replacement of English, and notices a clue in the one-letter word "N".

Chocolate Truffles

The Arithmetiquities // Chapter XXIII

In response to Rototasker's latest dessert demands, Dennis of Mudpatch prepares to mix up a batch of ganache for chocolate truffles.* He mixes 4 cups of cream and 24 ounces of chocolate, but the resulting ganache has the liquid consistency of icing and not the firm texture needed for truffle-making.

Dennis looks up a different ganache recipe specifically designed for making chocolate truffles. The new recipe calls for $\frac{3}{4}$ cup of cream and 8 ounces of chocolate.

Devise a method that Dennis can use to fix the first batch of ganache and achieve the texture of the new recipe.



Epilogue. Having made multiple meals for Rototasker, Dennis is convinced that he has satisfied the rodent's demands. When Rototasker asks Dennis about whether he knows any good recipes for corn chowder, Dennis decides to break the culinary cycle with a bit of subterfuge...

* Chocolate ganache is a mixture of chocolate and cream. Depending on what the ganache will be used for, the ratio of chocolate and cream might change. A runny, liquid ganache can be used as icing on pastries. A thicker, solid ganache can be rolled into a ball and used to make chocolate truffles.

Into Enemy Hands

The Arithmetiquities // Chapter XXIV

Xabier and Cortaderia Jubata have crept into the grasslands to spy on the stronghold of Gorgath the Hateful, barbarian warlord. The pair scan the stronghold for vulnerabilities, keeping at a safe distance and remaining camouflaged among the vegetation.

Gorgath, apparently sensing that he is being watched, steps out of the stronghold and eyes the horizon with suspicion.

Everything would have been fine if Cortaderia had not, at that very moment, found an emerald pill-bug at her feet. “How cute!” cries the naturalist, throwing her arms in the air.

Their cover blown, Xabier begins running due east toward the stronghold at 9.5 meters per second. Having spotted the spies, Gorgath simultaneously begins moving due west at 5.5 meters per second. Fearing for her safety, Cortaderia begins moving due west at 3 meters per second.*

If our heroes were hiding 630 meters directly west of the stronghold when they were discovered, how long will it take Xabier and Gorgath to meet? When they meet, how far will Cortaderia be from their meeting point?



Epilogue. Gorgath and Xabier clash in the grasslands, and the elf nimbly avoids most of the barbarian’s attacks. Gorgath is a powerhouse of brawn however, and only has to land a single thwack. Xabier is knocked out cold and dragged back to the stronghold. Meanwhile Cortaderia, undiscovered in the distance, seeks allies for a rescue operation...

* It is not hard to explain the different rates of speed of the actors in this scene. Xabier is lean and swift, so they move the fastest. Cortaderia is older and moves the slowest. Gorgath is a musclebound tank of a man, built for strength and not speed — think “Gorgath smash!” and you’ll have the right idea.

Gremlin Outing

The Arithmetiquities // Chapter XXV

After putting the gremlin horde through so much pain and agony, Obb3lus decides to take the whole gang for a fun outing. Even the darkest of dark sorcerers has a heart.*

Due to budget constraints, however, only four options are practical:

Option A. *Swimming party!* Get a chance to discover, first hand, the true nature of that glowing green goo at the bottom of the pond. Nothing can touch this level of fun! (Seriously, don't touch it.)

Option B. *Hilltop Rattle Snake Sanctuary and Trauma Center.* Go behind the scenes to learn how doctors treat snake bite victims. All guests get a lollipop and enough sterile gauze to stop the bleeding!

Option C. *Catapult rides!* Feel the thrill of being hurled at neck-breaking speeds from the basket of an authentic medieval catapult. The first two lucky riders get to wear the helmets!

Option D. *Swine Sty Farms.* Step into the muddy shoes of a pig farmer in this fully immersive, actual-reality experience. The sights! The smells! The feeling of flies crawling up your nose! It's so real, you'll want to take a shower afterwards. Maybe two showers.

Upon counting up the votes, they find that the swimming party received 40 more than 40% of the votes. Catapult rides received 40 less than 50% of the number that the swimming party received. The snake sanctuary received 20 more than 50% of what catapult rides received, and the pig farm received the remaining 180 votes.

How many votes were cast in all, and where will the gremlins be going on their outing?



Epilogue. Having enjoyed some time away from the Sinister Ziggurat, the gremlins are in much higher spirits. They happily resume training for their upcoming overthrow of civilization...

* In fact, Obb3lus has a whole bunch of hearts. He keeps them in jars in the basement! Zing!

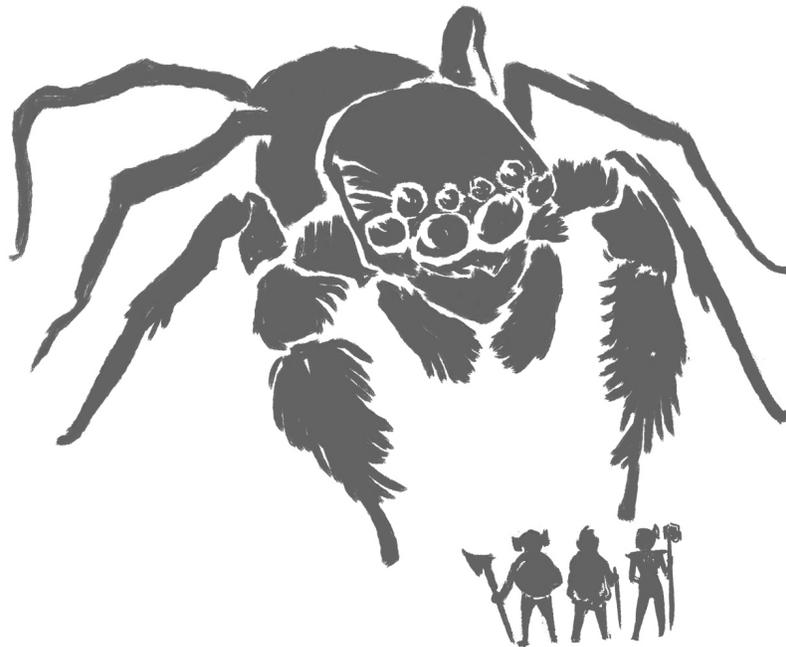
Hämähäkki

The Arithmetiquities // Chapter XXVI

The shieldmaidens, along with their mountaineering party, reach the Shrine of the Golden Rectangle only to find that **Hämähäkki**, matriarch of the ice spiders is already there, along with her minions!

Hämähäkki is surrounded by her royal guardian regiment, twenty fierce ice spiders with a long and valiant history of service to their matriarch. They have been through so many battles, in fact, that the members of this regiment have, on average, only seven legs (instead of the standard number of legs for an ice spider which, you may have guessed, is eight). One of them, the most grizzled guardian, has only 4 legs left!

Given this information, and knowing that every spider has a whole number of legs, what is the maximum number of spiders in the regiment who might still have all eight legs?



Epilogue. The situation gradually cools down and negotiations begin.* Although everyone was bracing for tense talks, it turns out that Hämähäkki is seeking the Rectangle only so that she could launch a public relations campaign to increase tourism to Yälä Peak. Tenzig strikes a deal with the ice spiders to start a company offering mountaineering excursions. Hämähäkki is therefore happy to let the shieldmaidens claim the Rectangle.

* The situation “cools down” in the sense that the emotional and psychological tension diminishes. Otherwise things are pretty cool, since all of this is happening inside an ice cave.

Sharkbite's Riddle

The Arithmetiquities // Chapter XXVII

Having studied Boss Paroot's treasure map, Astrid and Lothar make their way to a sunken seaside cave. They creep into the darkness, full of seaweed smells and dripping stalactites, and discover that the cave is haunted by the ghost of pirate captain **Loretta "Sharkbite" Duprix**.*

Duprix poses a riddle to the pair and refuses to hand over the Sieve of Eratosthenes until they can provide an answer. Worse, the ghost refuses to even let them leave the cave! Our heroes will be in trouble come high tide, unless they can think quickly! Sharkbite's riddle goes as follows:

Eleven greedy pirates were looting on the sea. They stole a chest of golden coins, as small as it could be. They tried to evenly divide the loot among their band. But in the end, one coin remained a-glinting on the sand.

*They could have left that coin behind. They **could** have but, instead, they brawled over the meager prize 'til one man wound up dead.*

They tried again to share the gold but found no more success. Again, they had one extra coin... and then one pirate less.

The third attempt the pirates made left no coins in the middle. Each pirate got an equal share, but how much? That's the riddle.



Epilogue. Astrid has a good head on her shoulders, of course, and she is able to answer Sharkbite's riddle. The ghost disappears in an angry puff of steam, and there, a-glinting on the sand, is the Sieve of Eratosthenes...

* Legendary pirate captain, Loretta Duprix earned her nickname after her leg was bitten off by a great white shark. After this tragic day, she vowed to track down and exact her revenge on the shark that took her leg. This was impossible, however, because the ocean is enormous and it was super easy for the shark to hide.

Last Supper

The Arithmetiquities // Chapter XXVIII

Dennis is sick of negotiating an endless menu with Rototasker in exchange for the Roots of Unity. The rodent's perpetual waffling about what food he wants prompts Dennis to cook up a tricky plan.*

Early one morning, Rototasker awakens to find Dennis washing dirty bowls in the nearby stream. Rototasker scurries over and, with ears and tail twitching, asks Dennis, "Why do you have so many bowls?"

"They're from last night's feast!" Dennis exclaims. "You ate for hours and hours. Don't you remember?"

Rototasker squints at Dennis suspiciously. "Hmm. I don't remember any feast. Hours and hours, you say? How many hours?"

"I'm sure I don't know," Dennis replies, "but, boy, was I busy. I brought you a bowl of rice every 12 minutes, a bowl of skunk and pumpkin stew every 18 minutes, and a bowl of banana pudding every 24 minutes. By the end of the night, I had a pile of sixty-five bowls to wash!"

Rototasker cocks his head. "Is that right? I must have slipped into a bit of a food coma after eating so much..."

Dennis nods. "That's right, you zonked out face-first into a bowl of pudding. That was right after you said you couldn't have dreamed of a better meal. You told me that you were *completely satisfied*."

"Completely satisfied? That doesn't sound like me," Rototasker muses, "though I do love banana pudding." Rototasker lets out a heavy sigh. "Well, I'm a squirrel of my word. If I was completely satisfied, then you have held up your end of the bargain. You may take some Roots!"

Though it was a phantom feast that never really happened, how long would the feast have been, if Dennis used as many bowls as he said he did?



Epilogue. Finally, Dennis is able to collect the object of his quest! He plucks a basketful of the Roots of Unity from the base of the Counting Tree and says goodbye to Rototasker. Dennis begins to make his way out of the Cayleywood, unaware that his path will take him through the realm of the fairies...

* Rototasker's waffling has included, among other things, Belgian-waffle-related waffling, chicken-and-waffle-related waffling, and falafel-and-waffle-related waffling.

Gorgath the Hateful

The Arithmetiquities // Chapter XXIX

Xabier has been captured by Gorgath the Hateful. Although unsure about how to escape the warlord's clutches, Xabier notices a positive result of having been taken prisoner inside the stronghold. Zeno's Arrow is framed and hanging on the wall behind the warlord's throne!

Burly barbarians drag Xabier to Gorgath's feet, and the warlord launches into a typical "mwah-ha-ha" monologue about how he captured the great elf ranger. Just then, there is a crescendo of thumping and pattering from the southern wall of the stronghold. A swarm of wegu lizards* comes sprinting over the top of the wall, and the interior of the stronghold is plunged into chaos!

The swarm includes red-spotted wegu, black-spotted wegu, red-banded wegu, and black-banded wegu. One third of all the red wegu are spotted, three fourths of all the black wegu are banded, and six tenths of all the wegu are red.

What fraction of the wegu are banded?



Epilogue. With the barbarians distracted by hundreds of running, hissing lizards, Xabier is able to snatch the Arrow from its display and vault over the wall. When they reunite with Cortaderia, she shouts a retreat in the wegu language. The pair disappear back into the grasslands amid the scattering army of lizards...

* The collective noun for a group of lizards is a "lounge of lizards", just as we might talk about a "pride of lions" or a "murder of crows". But, since the lizards are running around like crazy, dodging and distracting the barbarians, the word "lounge" seems a bit out of place here, don't you think?

Riddle of the Rectangle

The Arithmetiquities // Chapter XXX

Having negotiated a truce with Hämähäkki, matriarch of the ice spiders, the Shieldmaidens of Lumparland enter the shrine of the Golden Rectangle.

At the northernmost end of the shrine, they find three mysterious doors set in the icy wall.* Above the doors is an inscription: When one door opens, two doors lock forever. “It appears,” Egga says with a sigh, “that we only get one shot at this. Any ideas?”

Floora approaches the first door, brushes away a layer of snow, and calls out to the others. “This door has something written on it!” Further inspection reveals an inscription on each of the doors.

The inscription on the first door reads: The Rectangle is behind this door. The inscription on the second door reads: The Rectangle is not behind this door. The inscription on the third door reads: The Rectangle is not behind the first door.

Quiet descends on the shrine as the three ponder the riddle. Suddenly, Greta breaks the silence. “I remember a line from Zethar’s Codex! I didn’t understand it at the time, but I think this may have been what it was talking about! The line read, ‘If I tell you how many of the inscriptions are true, you will know for certain which door hides the prize.’ ”

Using this clue, the shieldmaidens were able to work out the correct door. Which door hides the Golden Rectangle?



Epilogue. Having claimed the Golden Rectangle, the shieldmaidens descend the snowy mountain, bound for the rendezvous point near Obb3lus’s Sinister Ziggurat...

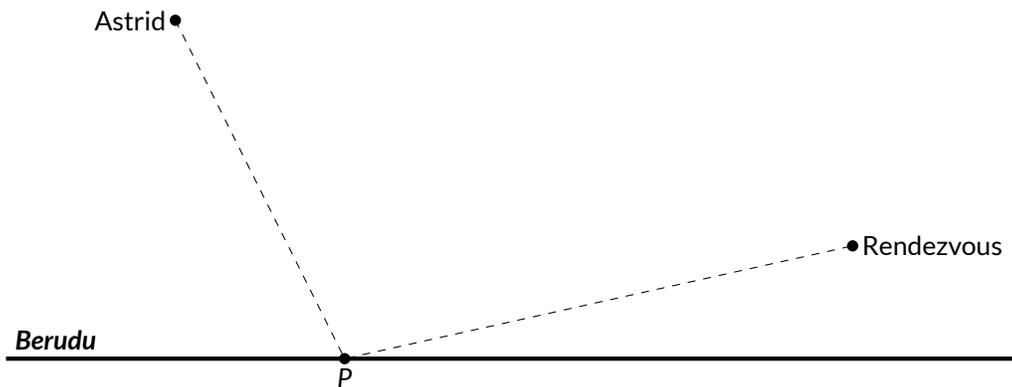
* The doors themselves are not particularly mysterious: they’re just regular doors with doorknobs and everything. The mysterious part, of course, is that they are embedded in the wall of an ice cave.

Mystical Waters

The Arithmetiquities // Chapter XXXI

Soon after taking possession of the Sieve of Eratosthenes, Astrid receives a message from L3mm0nsc8 (carried to her by a trained pigeon). The wizard asks that she make a detour to collect water from the Berudu River, a tributary of the Anura. L3mm0nsc8 has discovered in his research that the mystical waters of the Berudu are required for the final ritual.*

Astrid is 60 kilometers due north of the Berudu. The rendezvous point for the Fellowship is 20 km north of the Berudu and 120 km downstream of her current position. Astrid has to decide where along the Berudu she should collect the water in order to minimize her total travel distance.



Point P shows one option for where Astrid might collect the water.
The dashed lines represent her path of travel.

Make a scale model of this scenario on graph paper and investigate different locations Astrid might choose to visit the Berudu. What is her total travel distance in each case? Where along the river would you suggest Astrid go so that her total travel distance is as short as possible?



Epilogue. After filling jugs at the Berudu, Astrid has acquired another piece of the puzzle. She and Lothar continue on their way to the rendezvous point...

* Fun fact: In addition to being an ingredient in many ancient rituals, Berudu water makes an excellent furniture varnish. Some claim it is also refreshing to drink.

Exit Roots

The Arithmetiquities // Chapter XXXII

Dennis has picked a basketful of the Roots of Unity and is finding his way out of the Cayleywood.

Unfortunately, the forest contains many magical and mischievous denizens. Shortly after leaving Rototasker, Dennis is stopped by a swarm of **greenies**, tiny fairies that travel in glittering swarms.* The greenies demand payment of one half of the Roots in Dennis's basket, plus two more. Though reluctant to hand them over, Dennis does so. He knows better than to run afoul of fairy magic.

A little further on, he is stopped by a second swarm of greenies. This group demands payment of one half of the Roots Dennis now has, plus two more. Dennis complies and sets off again.

Just at the edge of the forest, Dennis is confronted by a third sparkling swarm of greenies. They demand one half of his remaining Roots, plus two more. Dennis grits his teeth and pays them. Dennis departs the Cayleywood with only two Roots left.

How many Roots did he pick initially?



Epilogue. Hoping that two Roots will be enough, Dennis says good riddance to the Cayleywood, and begins his final journey to the rendezvous point...

* Despite the nomenclature, greenies are not always green. Individual greenies can change color at will, and whenever a group of greenies congregates, they change colors rapidly until, eventually, the swarm becomes monochromatic. Greenie researchers in the department of Fey Studies at Bramblewine Academy call this "synchronization scintillation".

Grassland Caravan

The Arithmetiquities // Chapter XXXIII

With the helpful distraction of a lizard stampede, Xabier and Cortaderia Jubata have escaped Gorgath's barbarian stronghold with Zeno's Arrow. Their final task is to make sure Xabier gets out of the grasslands alive.

It would take a traveler six days to exit the grasslands on foot. The average traveler, however, can only carry a four-day supply of water. This means that one person cannot make the trip alone: their water would be gone after four days, but the journey takes two days more.

Cortaderia suggests that Xabier enlist the help of a herd of ontelope who frequent a nearby watering hole.* An ontelope can also carry a four-day supply of water though, like any traveler, an ontelope must drink water, too.

Devise a plan by which Xabier can exit the grasslands using the ontelope herd as helpers. Assume that Cortaderia can tell an ontelope exactly when and where to pick up and put down a water jug. Note: All of the helpers must return safely to the watering hole!



Epilogue. As Xabier prepares to depart, Cortaderia says she must say goodbye. She will return to her hut and continue to study the local wildlife. Xabier, forever grateful for all her teaching, continues their journey to the rendezvous point alone...

* The ontelope is a graceful herbivore that roams the grasslands in herds. These gentle creatures have long, nimble legs for escaping predators.

Gremlin Army

The Arithmetiquities // Chapter XXXIV

Having raised an intimidating army of gremlins, Obb3lus attempts to organize them for battle. He wants them to form up into a square, with an equal number of gremlins in rank and file.* The first time he tries to do this, however, he finds that he has an excess of 59 gremlins.

He increases both rank and file by one gremlin equally, trying again to form a square. This time, he finds that he is 84 gremlins short.

How many gremlins does Obb3lus have at his command? How can he arrange his gremlins into a rectangle that is as close to a square as possible?



Epilogue. Geometric organization under control, Obb3lus makes final preparations for taking his gremlin army forth into the field of battle...

* The words “rank” and “file” are military terms that mean soldiers are arranged in horizontal rows (ranks) and vertical columns (files).

Mathemagical Ritual

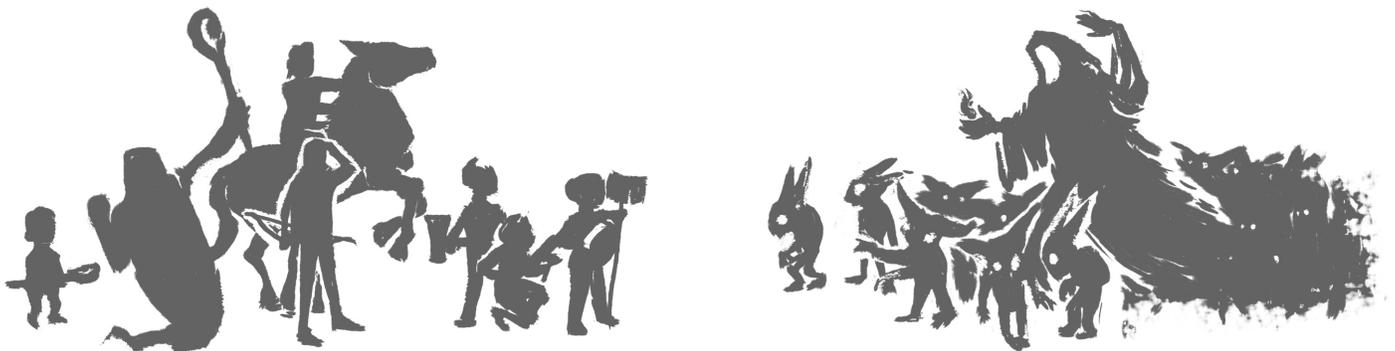
The Arithmetiquities // Chapter XXXV

Having collected the fabled Arithmetiquities, the Fellowship of the Twilight Tower assembles near the Sinister Ziggurat of Obb3lus, the dark sorcerer.

L3mm0nsc8 begins the magical ritual that will trap Obb3lus and his gremlin army inside an extradimensional vortex.* The wizard places a Root of Unity in the Sieve of Eratosthenes and, using the sieve like a colander, washes the root in the waters of the Berudu river. He sets the Golden Rectangle on the ground and uses it as a cutting board, chopping the root into four chunks with the blade of Zeno's Arrow.

The heroes must now place these fourth-roots at the corners of a square such that Obb3lus's sinister ziggurat is precisely at the square's center.

Suppose the ziggurat is located at the point $(-3,1)$ on the coordinate plane, and the heroes perform the ritual at the point $(7,7)$. Name the points where the heroes must place the other three chunks!



Epilogue. Good news: The ritual is a success! Obb3lus and his army of gremlins are zapped into extradimensional space, rendering them unable to bring harm to the land of Sfera. Bad news: L3mm0nsc8 isn't entirely certain of how to visualize extradimensional space, or even where it is. Obb3lus may still be out there, lurking in some higher dimension and plotting his revenge!

* L3mm0nsc8 discovered this ritual while reading *Grandolph's Guide to Successful Questing: From Forming Your Fellowship to the Final Fracas* (eighth edition, with additional tips for interpreting prophecies correctly the first time). In fact, L3mm0nsc8 was reading the Guide when the magic recipe, "Using the Arithmetiquities to Vanquish Evil via Interdimensional Vortices", fluttered out and landed on the floor. It was written on the back of an old bookmark.

Journey's End

The Arithmetiquities // Chapter XXXVI

Having saved the land of Sfera from a dark sorcerer and an army of gremlins, the Fellowship of the Twilight Tower reflects on their epic adventures...

The human girl Astrid tells the group how she and Lothar traveled to the land of the frogfolk, outsmarted both a crime boss and an angry ghost, and captured the Sieve of Eratosthenes.

The dwarven shieldmaidens — Egga, Floora, and Greeta — tell how they trekked into the mountains, saved a snowbound yeti, negotiated with a giant spider, and found the Golden Rectangle.

The elf ranger Xabier, talks of their journey into the grasslands, the leopard attack that they survived, the wise mentor they met, and how they (and their lounge of lizards) reclaimed Zeno's Arrow from a barbarian warlord.

Dennis, the halfling of Mudpatch, explains how he was able to collect the Roots of Unity from the forest, despite its cranky denizens: a surprisingly hungry squirrel and multiple swarms of greedy fairies.

As the sun sets and the stories are shared, the adventure comes to a close... at least for now.

Mathematician Paul Lockhart observed that, "a good problem does not just sit there in isolation, but serves as a springboard to *other* interesting questions." We hope that these stories, and the mathematics they contain, have sparked your creativity to invent your own stories, to go on your own mathematical adventures.

Your challenge this time is an invitation to expand the story.

You might draw a picture of your favorite moment from the adventure! Maybe you will write a new story about this world! What other creatures live in the Cayleywood? What did Floora do before meeting Egga and Greeta? Where will Xabier go, now that this part of their journey is done?

Maybe your story will include a thought-provoking mathematical puzzle, or maybe it won't. Either way, it will be great because it's a story you want to tell. If you accept this challenge, you are further invited to share your creations; our website is below. In any case, thanks for being a part of the adventure!

