When you turn in one of these problems make sure that the paper has your name, the problem number, the due date and the reference number on it. Note that the page and numbers refer to Crossing the River with Dogs, 2nd ed. and the first number in reference number indicates the corresponding chapter. For all “A” problems, you are required to use the problem solving technique from that chapter. For all other problems, you can use any problem solving technique we have studied.

1. Due August 23, 2017 (ref. 0A1-2) page 9, number 2.

2. Due August 23, 2017 (ref. 1A2-4) Nine members of a finance committee could not get together for an emergency meeting. However, during the next three days, each member talked to each other member on the telephone. What is the minimum number of phone calls needed to accomplish this?

3. Due August 28, 2017 (ref. 1A2-8) The R-Double-7 Ranch has a new owner. The 30 animals, all ostriches and horses, are dismayed because they have heard that he is both foolish and inexperienced. This turned out to be true—not being quite sure what he was looking for, he checked on the health of his animals by inspecting all of their feet. There were 96 feet in all. How many ostriches are on the ranch?

4. Due August 28, 2017 (ref. 1A2-10) We told Gavin not to run, but he did anyway. He took about 18 steps from second base, got caught in a rundown, took 7 steps back, then took 3 steps forward, 5 steps back, 11 steps forward, 4 steps back and was tagged out halfway between second and third base. How many steps is it from second base to third base?


6. Due August 30, 2017 (ref. 2A2-8) The bicycling club rented three vans to take people skiing. Each van could hold 7 people. As it turned out, only 12 people could make the trip, but because of the amount of equipment they had to bring, they still needed all the vans. Peter, the leader, said, “I don’t care who goes in what van, but obviously we need at least one driver in each van.” Without regard to which vans the three groups get into or to who is in which group, in how many different ways can the 12 people be split up?

7. Due September 6, 2017 (ref. 2A2-11) Give a systematic list that shows how many ways there are to make change for 55 cents using only quarters, dimes and nickels.


11. Due September 13, 2017 (ref. 3B2-1) Selena cut a log into three pieces in 6 minutes. She then cut a similar log into five pieces. How long would have the second job taken if she worked at the same rate she had worked when cutting the first log?

12. Due September 13, 2017 (ref. 3B2-4) The Simpson family recently gave birth to twins. In the twins’ early months the didn’t do too much other than eat, sleep and poop. In fact, even when they were awake, they did a lot of yawning. One day, their aunt was visiting and she noted the following:

   BABY + BABY = YAWNS.

   Their father said, “That is a good cryptarithmetic problem.” You solve the problem. Remember, each letter stands for one of the digits 0 to 9, and no two letters stand for the same digit.
15. **Due September 20, 2017** (ref. 5B4-4) At Camp Naytahwaush there was a great playground. Five kids loved to play there: Lisa, Danny, Justin, Jacob, and Jamie. There last names were Bland, Walker, and Horlick (there were two sets of siblings among the five). Each child had a favorite activity at the playground: slide, tire swing, monkey bars, rings and a big rock. Determine each persons full name and favorite activity.

(a) At Camp Naytahwaush there were three groups for the kids: the Marmots for kids 10-12 years old, the Chipmunks for the 6- to 9-year-olds, and the Minnows, for the 3- to 5-year-olds. None of the five children were Minnows. Jacob and the younger Horlick were Chipmunks. Lisa and the two Walkers were Marmots.

(b) Lisa didn’t spend very much time on the playground, but when she did, she never went on the tire swing or the slide.

(c) None of the Marmots liked the rock. Danny said he didn’t either.

(d) Jamie was only 9, but she was a Marmot anyway so that she could be in the same group with her brother.

(e) The elder Horlick and the two Chipmunks didn’t like the monkey bars.

(f) A girl liked the tire swing.


17. **Due September 25, 2017** (ref. 4B1-2) page 111, problem 2.

18. **Due September 25, 2017** (ref. 4B1-3) page 111, problem 3.


20. **Due October 2, 2017** (ref. 5A2-2) There was a great clearance sale going on at Tucker’s Department Store. Starting at 9:00 a.m., Asa called his friends Maggie, Spencer, and Pam to tell them about it. Each of Asa’s friends called three of their friends in the next half hour but did not call any more friends after those three. Each subsequent person who was informed about the sale called three more during the next half hour. The pattern of friends calling friends continued until just before 3:00 that afternoon. How many people heard about the sale as a result of Asa and his friends?

21. **Due October 4, 2017** (ref. 5A2-4) Paloma and Chuck opened a “bird and beef” stand that featured hamburgers and gourmet squab fillets. On the first day nobody came. On the second day, however, there were two customers. On the third day there were four customers, and on the fourth day there were six customers. After 50 days, how many customers total will have been served if this pattern keeps up?

22. **Due October 4, 2017** (ref. 5A1-12) page 137, number 12.

23. **Due October 9, 2017** (ref. 5B4-2) Russell’s cake measures 18 inches by 20 inches. The cake sat on the table in front of Russell with the 18-inch sides on the left and the right. Russell cut off pieces of the cake, each measuring 2 inches by 2 inches, and served them to the guests at his party. His friends all like sugar, so he cut off side pieces, starting at the bottom right and worked his way clockwise all
the way around the cake. After he cut off the last side piece, he continued cutting and serving in a
clockwise spiral starting from the bottom right. What was the original location of the last piece he
served?

24. Due October 9, 2017 (ref. 6A1-1) page 166, number 1.

25. Due October 11, 2017 (ref. 6A1-6) page 166, number 6.

26. Due October 11, 2017 (ref. 6A1-17) page 169, number 17.

27. Due October 16, 2017 (ref. 7A1-5) page 191, number 5.

28. Due October 16, 2017 (ref. 7A2-7) Eight cubic yards of soil that is 50% sand had to be mixed with
some soil that is about 10% sand to lower the percentage of sand to 18%. From this action how many
cubic yards of soil with 18% sand were produced?

29. Due October 18, 2017 (ref. 7A1-15) page 193, number 15.

30. Due October 18, 2017 (ref. 7B1-1) page 196, number 1.

31. Due October 23, 2017 (ref. 7B1-5) page 198, number 5.

32. Due October 23, 2017 (ref. 9A2-1) What is the last digit in the product

\[(3^1)(3^2)(3^3)(3^4) \ldots (3^{397})(3^{398})(3^{999})\]

33. Due October 25, 2017 (ref 9A2-3) Find the sum of the first 8000 multiples of 3.

34. Due October 25, 2017 (ref. 9A1-6) page 258, number 6.

35. Due October 30, 2017 (ref. 9A2-7) None of us really got along as friends, but we shared several
things in common. We had some joint business dealings and a love of old Mustangs. We only like
the ones from the 1964 through the 1968 model years. When we found out that the collection of
Mustangs from the Sparks Auto Museum was going to be auctioned off, we put our minds and our
money together. Instead of bidding against each other, we decided to bid as a group on each Mustang
available. We set a maximum price we would bid, and quite frankly, none of us had any favorites; we
loved them all equally. We also agreed to divide “our take” as follows: 1/2 to Travis because he was
usually the big money on our projects, 1/4 to Sandra as she was usually the brains that got things
done and I was to get a 1/6 share. In the end we were the winning bidders on 11 mustangs. How many
Mustangs do each of us get?

36. Due October 30, 2017 (ref. 11A1-12) page 313, number 12.

37. Due November 6, 2017 (ref. 11A1-16) page 314, number 16.

38. Due November 6, 2017 (ref. 16A1-4) page 460, number 4.


40. Due November 8, 2017 (ref. 17B1-5) page 497, number 5.
41. **Due November 13, 2017** (ref. 4B2-1) Lois Onassis wishes to establish shipping routes around the Pacific Rim. She wants to set up freight services in the following eight ports: Los Angeles (United States), Anchorage (United States), Tokyo (Japan), Taipei (Taiwan), Manila (Philippines), Auckland (New Zealand), Valparaiso (Chile), and Lima (Peru). She wants a separate shipping route connecting each pair of ports. How many such routes does she need to establish?

42. **Due November 13, 2017** (ref. 4B2-2) Five friends each have a certain number of jacks. Amy has the fewest, Betty the next fewest, then Clarisse, Dawn and finally Ellen who has the most. Each girl has a different number of jacks, and each number is a two-digit prime number ending in 9. The problem with having a prime number of jacks is that they cannot be arranged into piles with the same number of jacks in each pile unless each pile has exactly one jack—and that’s boring. A girl with an even number of jacks has more options: two piles of four, four piles of two and eight piles of one, for example. Since this is more exciting, each girl occasionally likes to combine her jacks with another girl’s jacks to be able to separate them into piles of equal sizes. Which pair of girls can combine their jacks and be able to separate them into same-sized piles in the greatest number of different ways? Which pair combines for the least number of ways?

43. **Due November 15, 2017** (ref. 4B2-3) Brandon is Rodd’s father. Jesse is Rodd’s only brother. Tina is Rodd’s sister-in-law. Rodd is not married. Mela is Tina’s mother-in-law. Jordan is Jesse’s son. What relation is Jordan to Mela? What relation is Tina to Brandon?

44. **Due November 15, 2017** (ref. 338-2) Two 3-year-olds, Bob and Ray, are riding their trikes back and forth across a playground. Each of them rides at a constant speed, although their speeds are different, and they each take no time to turn around at either end of the playground. Bob starts at the west end of the playground, and Ray starts at the east end. They start at the same time and ride toward each other. They meet and pass each other 30 feet from the east end of the playground. When they reach the opposite end of the playground, they turn around and ride back toward each other. They meet again 14 feet from the west end of the playground. What is the length of the playground?

45. **Due November 27, 2017** (ref. 17B4-2) The offense for the Wolfies is bad. They scored a touchdown in each of 13 different football games, but never scored a touchdown in both halves of any game. There were 11 scoreless first halves and 12 scoreless second halves in all. How many games did the Wolfies play this season?

46. **Due November 27, 2017** (ref. 17B4-4) There is a mirror in my bathroom. If I look at it in just the right way, I can see my digital clock. It is a 12-hour clock. Sometimes when I look I see a legitimate time (ignoring the colon and spacing). For example, when it is 5:28, I see 852, which is a legitimate time. How many times in a 24-hour day does the clocks reflection read a legitimate time that is not the current time?

47. **Due November 29, 2017** (ref. 17B2-2) Sisters Lynnette and Ryley play on the QueenAirs basketball team. Last month they both scored the same number of points. Together they had the same number of one-point free throws as two-point field goals, and this number as also the number of three-point field goals. Lynnette had three times as many free throws as she had two-point field goals. Ryley had five times as many two-point field goals as she had three-point field goals. They scored less than 200 points total. How many of each type of score did they each make?

48. **Due November 29, 2017** (ref 344P-1) On the planet Rigel, time is measured in units of minutes, hours, days, weeks, months, and years. Because Rigel is in a different solar system, the length of time
for each unit is different than it is on Earth. The following information refers to the time on Rigel. There are twice as many weeks in a month as there are days in a week. There are as many days in a month as there are months in a year. There are half again as many hours in a day as there are minutes in an hour. There are eleven times as many hours in a day as there are days in a week. There are 235,224 minutes in a year. How many hours are there in a week?

49. Due December 4, 2017 (ref 339P-2) Mike and Troy were jogging on the football field, which is 100 yards long and 50 yards wide. They started at opposite ends of the field, in the corners on the same side of the field. They ran toward each other. Each boy ran at constant speed, although Mike ran faster than Troy. Mike passed Troy after Mike had run 60 yards and Troy had run 40 yards. They continued on and ran all the way around the field, passing each other again at some point. It took Mike 15 seconds to finish his lap after he passed Troy the second time. How long did it take Troy to run around the field?

50. Due December 4, 2017 (ref 334P-2) Five logicians played a game where four of them (Ryan, Torrey, Michael, and Bonnie) were contestants and one, Janet, was the emcee who ran the game. Janet shuffled four white hats and three black hats and when the other four had closed their eyes, she placed a hat on each of their heads and lined them up single file all facing in the same direction. Ryan, the person in the back, could see all of the other hats when he opened his eyes. Janet asked him if he knew what color hat he was wearing. He didn’t know and said so. Torrey was next in line. She could not see Ryan, but could see the other two players’ hats. She also said that she did not know the color of her hat. Michael could only see Bonnie’s hat, and said he did not know the color of his hat. Bonnie, who was in front immediately announced the color of her hat. What was the color of her hat and how did she know? Note that everyone heard everything that was said and the only things said are mentioned above.