1) **A** Regroup the numbers to calculate.

$4 + 11 + 2 + 9 + 6 + 8$

$= 4 + 6 + 11 + 9 + 2 + 8$

$= 10 + 20 + 10$

$= 40$

2) **B** The change that Hyunbin would get back is what the cashier owes him. This is equal to $10 − $6 = $4.

3) **D** Option A) $25 = 5^2$

Option B) $36 = 6^2$

Option C) $49 = 7^2$

Option D) $63 = 7 \times 9$ and it is not a perfect square.

4) **D** Three groups of 12 is equal to $3 \times 12 = 36$. Therefore, Jessamine needs to bake 36 cookies.

5) **B** There are eight students in Class 2A who ate a sandwich for lunch. There are 7 students who ate a sandwich in Class 2B. Therefore, $8 + 7 = 15$ students ate sandwiches across both classes.

6) **C** On the left side of the diagram, there are two paths. The top path is 8 m and the bottom path is 2 m + 3 m + 2 m = 7 m, so the bottom path is the shorter of the two. Therefore, the overall shortest path is 2 m + 3 m + 2 m + 5 m = 12 m.

7) **B** In fractions, the denominator tells us how many pieces make a whole.

Options A and C have a denominator of 6 while options B and D have a denominator of 7. If one whole is divided into six pieces, each piece would be bigger than if that same whole was divided into seven pieces, so options A and C can be eliminated. Meanwhile, the numerator tells us how many pieces we have. Since 2 is greater than 1, option D can be eliminated, so option B is the smallest fraction.

8) **A** Rephrase the question. All of them saw the dogs, except 5 of them did not saw the dogs. Therefore, 5 students did not see the dogs.

9) **C** Rose is playing the one that is not the violin, which means she is playing the piano. Therefore, the other one is the violin.

10) **A** An average is an equal distribution. To find the average number of paint colours, add up all the paint colours and divide them equally among the three of them. There are $8 + 21 + 13 = 42$ presents, so the average number of paint colours is $42 \div 3 = 14$.

11) **C** 6 rounded to the nearest ten is 10, so the difference is $50 − 10 = 40$.

12) **A** $28 \div 6 = 4$ R4. Therefore, 4 boxes will contain packages of six and there will be an extra box containing four packages

13) **A** List all the possible arrangements in an organized way: SUM, SMU, USM, UMS, MSU, and MUS. Therefore, there are six possible ways to arrange the letters in the word SUM.

14) **C** One dozen is 12. One-third of 12 is $12 \div 3 = 4$ cookies. Therefore, 4 cookies were overcooked.

15) **C** $5! + 3! = (5 \times 4 \times 3 \times 2 \times 1) + (3 \times 2 \times 1)$
$$= 120 + 6$$
$$= 126$$

16) **D** The prime numbers less than 100 have the digit 3 are 3, 13, 23, 31, 37, 43, 53, 73 and 83. There are 9 prime numbers less than 100 have the digit 3.

17) **C** All the options has 2 as factor, but only 12 and 18 has 3 as factor, then options B and C can be eliminated. Between 12 and 18 the only one who has 9 as factor is 18, therefore 18 is the number who has 2, 3 and 9 as factors.

18) **B** If Jerry will be 16 next year, he is 15 this year. Since Jimmy is 4 years older than Jerry, Jerry is $15 + 4 = 19$.

19) **C** 200 can be written as $2 \times 10 \times 10$. Since $10 = 2 \times 5$, there needs to be one 2 and two groups of 2×5 to equal 200. This is equal to three 2s and two 5s, so option C is the correct answer.

20) **B** The largest two-digit palindrome is 99 and the smallest four-digit palindrome is 1001. Therefore, the sum is $99 + 1001 = 1100$.

21) **D** One way that Xiumin can pick up all three stars is by moving one space east to pick up the star in the first row; moving two spaces south to pick up the star in the third row; and moving one space south and two spaces west to pick up the final star. Using the symbols, this is E*SS*SEE* or option C. Of the given options, this is the only option that directs Xiumin to pick up all the stars. The path taken is shown in the following diagram.
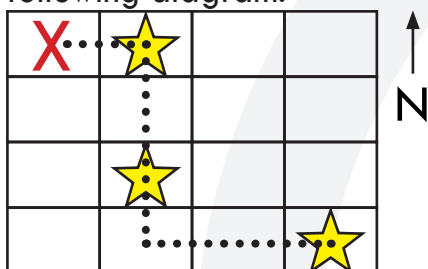
22) **C** If the average of four numbers is 10, then the sum of the four numbers must be $4 \times 10 = 40$. The sum of the three numbers given is $8 + 6 + 12 = 26$. Therefore, the missing number is $40 - 26 = 14$.

23) **B** The exact nature of the secret code is not given, but any numbers that are repeated in the secret code must represent the same number in Jiwon's birthday. Therefore, the correct answer can be achieved through a process of elimination. In the secret code, Jiwon's birth year is a palindrome. Since 2003 is not a palindrome, options C and D can be eliminated. Meanwhile, Jiwon's birth month is comprised of the same two digits. This means that option A can be eliminated, making option B the correct answer.

24) **D** Use a Venn diagram to solve this problem.
$9 - 2 = 7$ flowers have only pink petals
$13 - 2 = 11$ flowers have only blue petals
$7 + 11 + 2 + 5 = 25$ total flowers.

Total: 25 flowers
9 Pink   13 Blue

7   2   11

Neither: 5
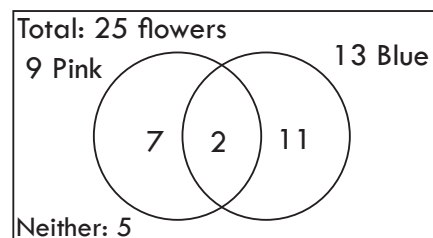
25) **C** Lesley did not read the pages before page 21, so she did not read pages 1 to 21, or 21 pages. If she finished at the top of page 40, her last page read was 39. Lesley read $39 - 21 = 18$ pages.

26) **B** Working backwards, the shape of Anna's card has $5 - 3 + 8 - 2 = 8$ sides. An eight-sided shape is an octagon.

27) **B** If there are two team members absent at a game, there will be nine students plus Kyle high-fiving, which makes 10 people in total. Each person will high-five nine other people, so there are $10 \times 9 = 90$ high-fives. However, each high-five is counted twice, so there are $90 \div 2 = 45$ high-fives in total.

28) **B** Count the paths to each intersection going South (down) and East (right). Each intersection is the sum of the two preceding intersections.

	1	1	1	1
1	2	3	4	5
1	3	6	10	15
1	4	10	20	35
1	5	15	35	70

29) **A** Make an organized chart to determine who like Math.

Since Lily does not like subjects with numbers and loves painting, so Lily likes Art.

Since Max, Emma and Noah all like subjects with numbers, they can like Math.

Since Emma has been practicing an instrument for a school performance, so Emma likes Music.

Since Noah wants to be a doctor and enjoys conducting experiments, so Noah like Science.

Since Max enjoys solving puzzles and is not interested in music, so Max likes Math.

	Math	Science	Art	Music
Lily	✗	✗	✓	✗
Max	✓	✗	✗	✗
Emma	✗	✗	✗	✓
Noah	✗	✓	✗	✗

30) **B** Label each region of the diagram and make a chart to help you count.
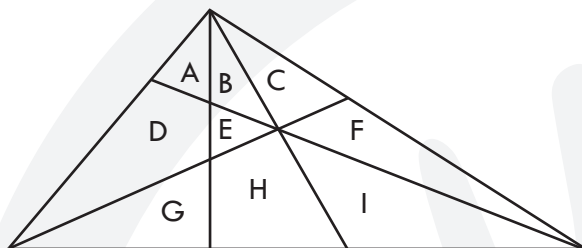
# of Letters	Name	# of triangles
1	A, B, C, E, F, G, I	7
2	AB, AD, BE, CF, DE, GH	6
3	ADG, BCE, BCF, BEH, CFI, GHI	6
4	ABCF, ABDE, FGHI	3
5	ABCDE, DEGHI	2
6	ABDEGH, BCEFHI	2
9	ABCDEFGHI	1
	Total	27