# Selective High School Placement Test

## Mathematical Reasoning

*Explained answers for Practice Test 4*

In partnership with

Assessment services delivered in collaboration with Cambridge University Press & Assessment

© UCLES

# SHSPT Trial 2026 Explained Answers

**1** Convert Coen's arriving and leaving times to 24-hour time:

3 pm is 1500
9 pm is 2100

His first 2 hours, from 1500 to 1700, cost \$2.25 each. That is \$2.25 + \$2.25 = **\$4.50** altogether.

His last 4 hours, from 1700 to 2100, cost \$1.00 each. That is 4 × \$1.00 = **\$4.00** altogether.

The total cost for parking is

**\$4.50** + **\$4.00** = \$8.50.

So the correct answer is **B** \$8.50.

**2** The student has placed the protractor in an unusual way, but we can still measure the angle. It is the difference between the protractor readings at the two lines.

We can use the inner scale or the outer scale, but we must use the same scale for both readings.

Using the outer scale: 153° − 66° = 87° (or using the inner scale: 114° − 27° = 87°).

So the correct answer is **D** 87°.

**3** Add the first two fractions:

$$\frac{1}{2}+\frac{1}{2}=\mathbf{1}$$

Add the next three fractions:

$$\frac{1}{3}+\frac{1}{3}+\frac{1}{3}=\mathbf{1}$$

Add the last two fractions:

$$\frac{2}{4}+\frac{3}{4}=\frac{5}{4}=\mathbf{1}\frac{\mathbf{1}}{\mathbf{4}}$$

The total is

$$\mathbf{1}+\mathbf{1}+\mathbf{1}\frac{\mathbf{1}}{\mathbf{4}}=3\frac{1}{4}$$

So the correct answer is **E** $3\frac{1}{4}$

**Tip:** To answer this question, we do not need to use a method for adding fractions with different denominators.

**4** In the first **2** minibuses, the number of people will be 17 + 17 = 34

In the small minibuses, the number of people will be 92 − 34 = 58
Each has space for 8 people, so divide this by 8:

58 ÷ 8 = 7 remainder 2

They need **8** small minibuses (7 full, and another with 2 people in it).

In total, they need **2** + **8** = 10 minibuses.

So the correct answer is **D** 10.

**5** Multiplying a number by 10 moves every digit one place to the left.
Multiplying a number by 100 moves every digit two places to the left.
Find the result of each calculation:

1 × 0.5 = 0.5

10 × 0.0127 = 0.127

10 × 0.052 = 0.52

100 × 0.0039 = 0.39

100 × 0.00074 = 0.074

Tenths are larger than hundredths or thousandths, so compare tenths first.

0.5 and 0.52 have the most tenths (5), so these are larger than the other results.

Now compare the hundredths.

0.5 has no hundredths and 0.52 has 2 hundredths, so 0.52 is larger than 0.5.

So the correct answer is **C** 10 × 0.052.

**6** Add the three numbers on the left:

456 + 456 + 456 = 1368

Now we can write 1368 = 6 × ■
or 6 × ■ = 1368

Division is the inverse of multiplication, so

■ = 1368 ÷ 6 = 228

So the correct answer is **B** 228.

**Tip:** There is a quicker method. We can rewrite the number sentence as

3 × 456 = 6 × ■

If 3 groups of 456 equal 6 groups of ■, then 1 group of 456 equals 2 groups of ■.

So ■ must be half as large as 456.

■ = 456 ÷ 2 = 228

**7** After spending $\frac{4}{5}$ of the money, the fraction left was

$$1 - \frac{4}{5} = \frac{1}{5}$$

If \$80 was $\frac{1}{5}$ of the money, we can find the total amount of money using a bar diagram. 5 fifths make 1 whole:

| $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ |
|---|---|---|---|---|
| \$80 | \$80 | \$80 | \$80 | \$80 |

The total is

5 × \$80 = \$400

So the correct answer is **E** \$400.

**8** To compare the masses more easily, write them all using the same unit. Here are all the masses in grams (using 1 kg = 1000 g, and $\frac{1}{4}$ kg = 250 g):

$\frac{1}{4}$ kg = **250 g**

**35 g**

0.3 kg = **300 g**

**25 g**

2.5 kg = **2500 g**

In order from lightest (smallest mass) to heaviest (largest mass), these are:

| **25 g** | **35 g** | **250 g** ($\frac{1}{4}$ kg) | **300 g** (0.3 kg) | **2500 g** (2.5 kg) |
|---|---|---|---|---|

The middle object has mass 250 g (which is $\frac{1}{4}$ kg).

So the correct answer is **A** $\frac{1}{4}$ kg.

**9** We can check each statement in turn.

Statement 1:
There are not 7 months when I can pick both beetroot and eggplant.
There are only 3 months (Feb, Mar, Apr):

| vegetable | action | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| beetroot | plant | ✓ | | | | | | | | | ✓ | ✓ | ✓ |
| | pick | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| eggplant | plant | | | | | | | ✓ | ✓ | ✓ | | | |
| | pick | | ✓ | ✓ | ✓ | | | | | | | | |
| carrot | plant | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| | pick | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | ✓ |

**Statement 1 is incorrect.**

Statement 2:
There is not only 1 month when I cannot plant any of these vegetables.
There are 5 months (Feb, Mar, Apr, May, Jun):

| vegetable | action | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| beetroot | plant | ✓ | | | | | | | | | ✓ | ✓ | ✓ |
| | pick | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| eggplant | plant | | | | | | | ✓ | ✓ | ✓ | | | |
| | pick | | ✓ | ✓ | ✓ | | | | | | | | |
| carrot | plant | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| | pick | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | ✓ |

**Statement 2 is incorrect.**

Statement 3:
In every month when I can plant beetroot (Oct, Nov Dec, Jan), I can also plant carrots.

| vegetable | action | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| beetroot | plant | ✓ | | | | | | | | | ✓ | ✓ | ✓ |
| | pick | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| eggplant | plant | | | | | | | ✓ | ✓ | ✓ | | | |
| | pick | | ✓ | ✓ | ✓ | | | | | | | | |
| carrot | plant | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| | pick | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | ✓ |

**Statement 3 is correct.**

So the correct answer is statement 3 only.

**10** There are 26 marbles in total. Yesterday Lan and Marco had 20 altogether, so yesterday Niki had

$$26 - 20 = 6$$

Today, Marco gave Niki 5, so Niki now has

$$6 + 5 = 11$$

Now Marco has the same number as Niki, 11.

Lan and Niki have the rest of the marbles, so they now have a total of

$$26 - 11 = 15$$

So the correct answer is **A** 15.

**11** Kira scores 8 points for her first coin.

After this, she needs 112 more points, because

$$120 - 8 = 112$$

Now she only gets 3 points for each coin.

$$112 \div 3 = 37 \text{ remainder } 1$$

She needs 38 more coins to score at least 112 more points (because 37 coins would only give her 111 points, and 38 coins give her 114 points).

Including the first coin, she must collect $1 + 38 = 39$ coins in total.

So the correct answer is **E** 39.

**12** Here are the children's balancing times:

Child 1: **12 minutes**

Child 2: 12 ÷ 2 = **6 minutes**

Child 3: 6 ÷ 2 = **3 minutes**

To avoid halving an odd number in the next step, we can change to seconds:

3 minutes = 3 × 60 seconds = 180 seconds

Child 4: 180 seconds ÷ 2 = 90 seconds = **1 minute 30 seconds**

Child 5: 90 seconds ÷ 2 = **45 seconds**

The total time is

**12 minutes** + **6 minutes** + **3 minutes** + **1 minute 30 seconds** + **45 seconds**

= 22 minutes + 75 seconds

= 23 minutes and 15 seconds

So the correct answer is **D** 23 minutes 15 seconds.

**13** We can check each statement in turn.

Statement 1:

Jonas has 6 cards. When he picks one at random, he is equally likely to pick each card.

There is one card with the letter C, so the probability he will pick this is 1 out of 6, or $\frac{1}{6}$. It is **not** $\frac{1}{4}$

**Statement 1 is incorrect.**

Statement 2:

Jonas and Keeva each have one card with the letter S, but they have different numbers of cards in total. Jonas has more cards than Keeva, so Jonas is less likely to pick S than Keeva. (The probability for Jonas is $\frac{1}{6}$ and the probability for Keeva is $\frac{1}{4}$)

So the probability that Jonas will pick S is **not** the same as the probability that Keeva will pick S.

**Statement 2 is incorrect.**

Statement 3:

Half of Jonas's cards (3 out of 6) have the letter E. So there is an even chance that Jonas will pick E.

Half of Keeva's cards (2 out of 4) have the letter E. So there is an even chance that Keeva will pick E.

Jonas and Keeva both have an even chance of picking a letter E, so Jonas is **not** more likely than Keeva to pick E.

**Statement 3 is incorrect.**

So the correct answer is 'none of the above'.

**14** After subtracting a multiple of 7 (that is greater than zero), Valerie has 59.

So her favourite number is 59 + a multiple of 7.

Add multiples of 7 to 59 to find the possibilities:

59 + 7 = **66**
59 + 14 = **73**
59 + 21 = **80**
59 + 28 = **87**
59 + 35 = **94**

**Tip**:
It is easier to add 7 repeatedly, which gives the same results:

59 + 7 = 66
66 + 7 = 73
73 + 7 = 80
80 + 7 = 87
87 + 7 = 94

(Since her favourite number is between 0 and 100, adding the next multiple of 7 gives a number that is too high: 59 + 42 = 101)

There are 5 possibilities for Valerie's favourite number (**66**, **73**, **80**, **87** or **94**).

So the correct answer is **B** 5.

**15** The total number of stickers is 4 × 6 = 24

There are 6 stickers in each packet. $\frac{4}{6}$ of a packet is 4 stickers.

So Hal takes 4 stickers from each of 3 packets. In total, he takes 4 × 3 = 12 stickers.

The number of stickers remaining is 24 − 12 = 12

Irene and Khaled share these 12 stickers, and Khaled gets twice as many as Irene. So we need to split 12 into two groups, with one group twice as large as the other:

6 and 6 ×
7 and 5 ×
8 and 4 ✓

Khaled gets 8 and Irene gets 4.

So the correct answer is **A** 4.

**16** If we move the left-hand rod to the left by 2 m and move the right-hand rod to the right by the distance ▲, the total length increases by **2 m + ▲**.

Now there are no overlapping parts. The length was 26 m and it is now 3 × 12 m = 36 m, so the increase in length is **10 m**.

So **2 m + ▲ = 10 m**
and ▲ = 10 m − 2 m = 8 m

> **Tip**: Here is another way of thinking about this problem.
>
> The total length of three rods without overlaps is 3 × 12 m = 36 m.
>
> The total length of the overlapping rods is 26 m, so the total length of the overlapping sections is 10 m.
>
> The total length of the overlapping sections is ▲ + 2 m. So ▲ = 10 m − 2 m = 8 m

So the correct answer is **E** 8 m.

**17** Ishaan's smallest possible number is **750** and largest is **849**.
(749 would round down to 700, and 850 would round up to 900.)

Jesse's smallest possible number is **950** and largest is **1049**.
(949 would round down to 900, and 1050 would round up to 1100.)

The largest possible difference is when Ishaan chooses his smallest possible number, **750**, and Jesse chooses her largest possible number, **1049**.

The difference is **1049** – **750** = 299

So the correct answer is **C** 299.

> **Tip**: Check what happens if Ishaan chooses his largest possible number, **849**, and Jesse chooses her smallest possible number, **950**: then the difference is only 101.

**18** We can answer the question in two steps:

Step 1: Work out how many skirts Nidhi has (which is the same as Chris).
Step 2: Use that to work out how many possible outfits Chris has.

**Step 1:**
Each of Nidhi's skirts can be worn with any of her 3 T-shirts.
For example, if Nidhi has only 1 skirt, she has 3 possible outfits:



and if she has 2 skirts, she has 6 possible outfits:



Nidhi's number of outfits must be 3 times her number of skirts.
So Nidhi's number of skirts is 24 ÷ 3 = 8

Chris has the same number of skirts as Nidhi, 8.

**Step 2:**
For each of her 2 T-shirts, Chris has 8 possible outfits (one for each skirt).
So Chris's number of outfits is 2 × 8 = 16

So the correct answer is **B** 16.

**19** For an equilateral triangle, all three sides have the same length. So if the perimeter of an equilateral triangle is 6 cm, the length of each side is 6 cm ÷ 3 = **2 cm**.

The perimeter of the shape is the total length of its outer edges.

The outer edges of the shape are made from **11** triangle sides (4 along the top, 1 on each side and 5 along the bottom).

The perimeter of the shape is **11** × **2 cm** = 22 cm.

So the correct answer is **A** 22 cm.

**20** There are 60 seconds in a minute, so 2 minutes = 120 seconds.

The robot takes 18 seconds to go up and down the ladder once.

Work out how many times 18 goes into 120:

1 × 18 = 18
2 × 18 = 36
3 × 18 = 54
4 × 18 = 72
5 × 18 = 90
6 × 18 = 108

**Tip**: We could start by estimating the number of 18s in 120, instead of starting from 1 × 18.

For example, we might start by trying 5 × 18. We would get 90, and then we could try adding more 18s.

After going up and down 6 times, the robot is at the bottom of the ladder and has 12 seconds left (because 120 − 108 = 12).

It has enough time to go up the ladder one more time, taking 10 seconds.

So it reaches the top of the ladder 7 times.

So the correct answer is **B** 7.

**21** There are two odd-numbered lengths (5 cm and 11 cm) and three even-numbered lengths (2 cm, 8 cm and 14 cm) to choose from.

To get an odd total from three numbers, they must be:

odd + odd + odd (such as 1 + 3 + 5 = 9), or

odd + even + even (such as 1 + 2 + 4 = 7)

Since there are only two odd-numbered lengths, Michael must choose lengths that are odd, even and even.

The possible choices are:

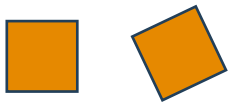
| | | | | | |
|---|---|---|---|---|---|
| 5 | 2 | 8 | 11 | 2 | 8 |
| 5 | 2 | 14 | 11 | 2 | 14 |
| 5 | 8 | 14 | 11 | 8 | 14 |

There are 6 different ways.

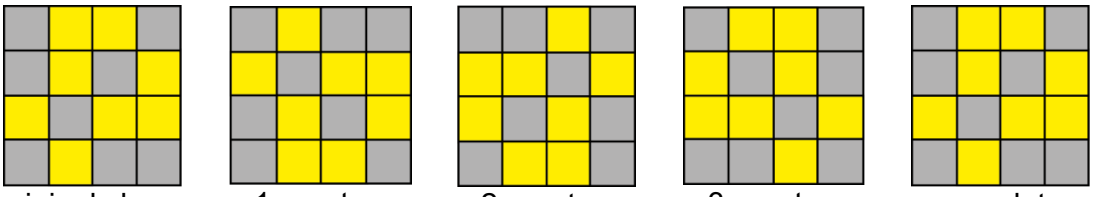
So the correct answer is **C** 6.

**22** A shape has rotational symmetry if it can look exactly the same after a rotation by less than a whole revolution (a full turn).

A square can only ever look the same after one or more quarter-turns. After any other rotation, it does not look the same. For example:

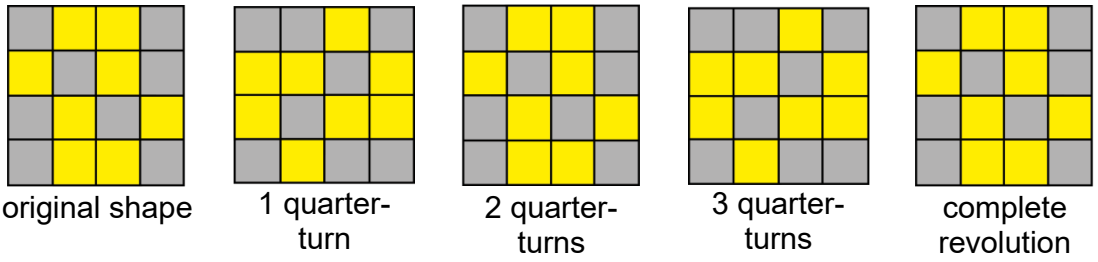


Here is shape 1 after different numbers of quarter-turns:



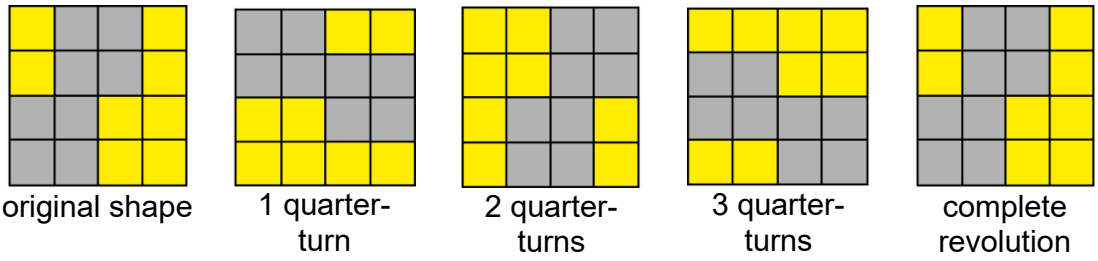

Shape 1 only looks the same after a complete revolution, so it has no rotational symmetry.

Here is shape 2 after different numbers of quarter-turns:




Shape 2 looks the same after two quarter-turns (one half-turn), so it has rotational symmetry.

Here is shape 3 after different numbers of quarter-turns:




Shape 3 only looks the same after a complete revolution, so it has no rotational symmetry. (Notice that it is not exactly the same after two quarter-turns, because the grey squares are further to the right than in the original shape.)

So the correct answer is shape 2 only.

**23** For the people in each row, the total number of pets is the number of people multiplied by the number of pets for each person.

For example, the number of pets in the '2 pets' row is 2 × 6 (because there are 6 people with 2 pets each).

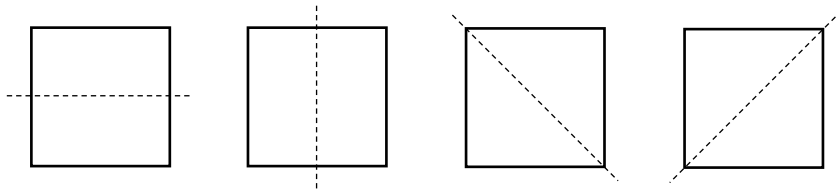
The table shows the total number of pets for every row.

| number of pets (for each person) | number of people | total number of pets |
|---|---|---|
| 0 | 7 | 0 × 7 = **0** |
| 1 | 12 | 1 × 12 = **12** |
| 2 | 6 | 2 × 6 = **12** |
| 3 | 9 | 3 × 9 = **27** |
| 4 | 5 | 4 × 5 = **20** |

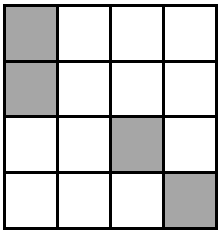
The total number of pets of all the people is **0** + **12** + **12** + **27** + **20** = 71.

So the correct answer is **D** 71.

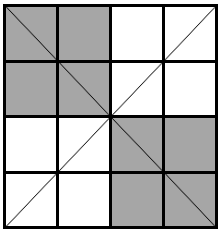
**24** For a square pattern, the possible lines of symmetry are horizontal, vertical and diagonal:



At the start, the grid has no lines of symmetry:

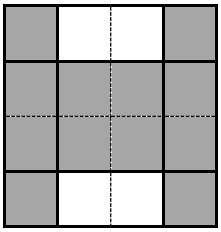


The grid can be given exactly two lines of symmetry by shading 4 more squares, like this:



It now has diagonal lines of symmetry but not horizontal or vertical lines of symmetry.

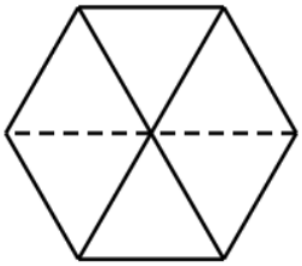
The grid could be given horizontal and vertical lines of symmetry instead, as shown below, but 8 more shaded squares would be needed:



The smallest number of squares Nate needs to shade is 4.

So the correct answer is **B** 4.

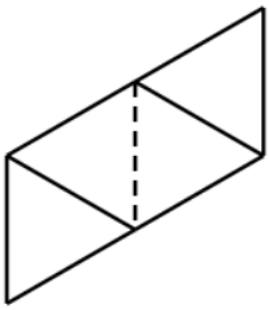
**25** By adding a horizontal line to the drawing of the hexagon, we can see that the hexagon is made of 6 identical triangles.



The area of each triangle is 48 $cm^2$ ÷ 6 = **8 $cm^2$**

Each rhombus is made of two triangles, so the area of each rhombus is 16 $cm^2$.

The parallelogram can be made by joining 1 rhombus and 2 triangles:

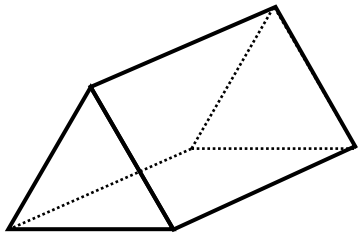


This has the same area as 4 triangles, which is 4 × **8 $cm^2$** = 32 $cm^2$

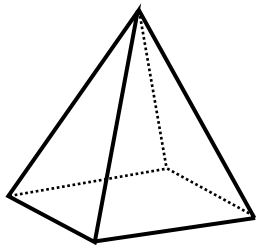
So the correct answer is **C** 32 $cm^2$.

**26** Consider each of the three types of object.

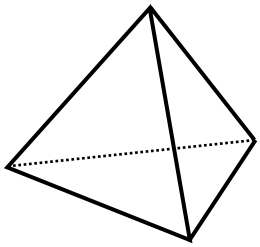
- A triangular prism has **9** edges: 3 on the front face, 3 on the back face and 3 connecting the front and back faces.



- A square pyramid has **8** edges: 4 around the base and 4 connecting each vertex of the base to the top of the pyramid.



- A triangular pyramid has **6** edges: 3 around the base and 3 connecting each vertex of the base to the top of the pyramid.



Since the edges are all the same length:

number of edges × edge length = 48 cm

and

edge length = 48 cm ÷ number of edges

Each edge length is a whole number of centimetres.

- Triangular prism: 48 cm ÷ **9** is not a whole number, so this is not possible.
- Square pyramid: 48 cm ÷ **8** = 6 cm, so this is possible.
- Triangular pyramid: 48 cm ÷ **6** = 8 cm, so this is possible.

The correct answer is square pyramid and triangular pyramid only.

**27** The number increases by 4 each time.

The difference between the first and last numbers in the pattern is 404 − 16 = 388

So the number of 'jumps' from one number to the next is 388 ÷ 4 = 97

If there are 97 jumps, there are 98 numbers in the pattern. (There is one number at the start, and then each jump makes another number.)

So the correct answer is **D** 98.

**28** In January:

- Milly swims on 1st, 4th, 7th, 10th, and so on. These numbers are 1 more than multiples of 3 (0, 3, 6, 9, …). Her last swimming day in January is 31st.
- Konol swims on 1st, 3rd, 5th, 7th, and so on. These are all the odd-numbered dates in January. His last swimming day in January is 31st.

None of the Mondays in January (1st, 8th, 15th, 22nd and 29th) has a date that is odd and also 1 more than a multiple of 3.

In February:

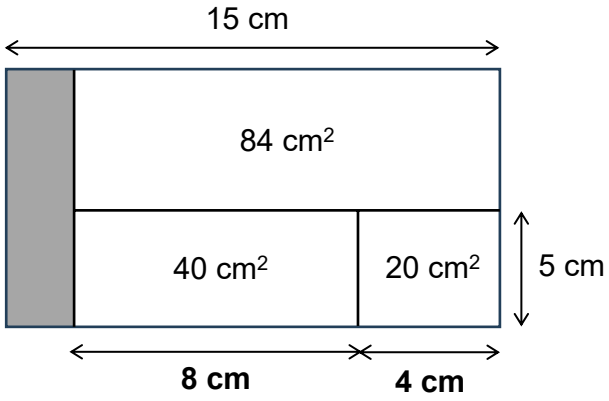
- Milly swims on 3rd (three days after 31st January), and every three days after that. So she swims on all the dates in February that are multiples of 3.
- Konol swims on 2nd (two days after 31st January), and every two days after that. These are all the even-numbered dates in January.

In February, the first Monday (5th) has an odd-numbered date. The second Monday (12th) has a date that is even and a multiple of 3.

So the correct answer is **E** 12th February.

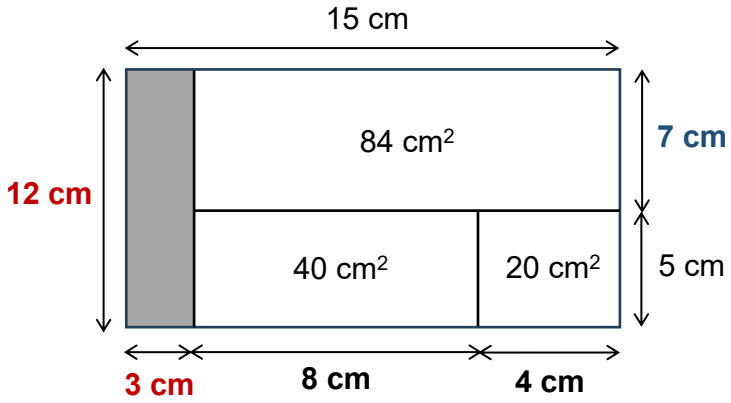
**29** We can use the information given to work out other distances on the diagram.

The length of the 40 $cm^2$ rectangle is 40 $cm^2$ ÷ 5 cm = **8 cm**
The width of the 20 $cm^2$ rectangle is 20 $cm^2$ ÷ 5 cm = **4 cm**




So the length of the 84 $cm^2$ rectangle is 12 cm and the width is 84 $cm^2$ ÷ 12 cm = **7 cm**

The width of the grey rectangle is 15 cm − **8 cm** − **4 cm** = **3 cm**
The length of the grey rectangle is **7 cm** + 5 cm = **12 cm**




The area of the grey rectangle is **12 cm** × **3 cm** = 36 $cm^2$

So the correct answer is **D** 36 $cm^2$.

**30** Since ■ is even, when it is divided by 2 the result is a whole number.
The nearest 10 to this whole number is 50, so it must be a number from 45 to 54.

So ■ must be an even number from 90 (double 45) to 108 (double 54).
The possible values are:

90 92 94 96 98 100 102 104 106 108

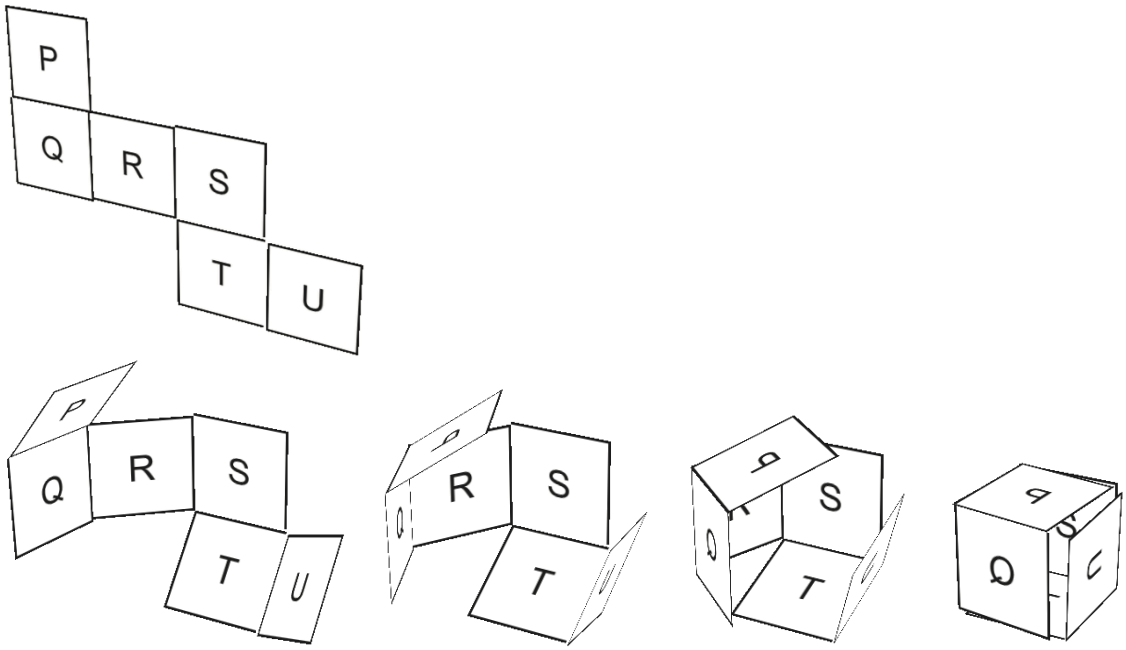
The sum of digits, ▲, for each of these numbers, is:

9 11 13 15 17 1 3 5 7 9

The largest possible value of ▲ is 17.

So the correct answer is **D** 17.

**31** Imagine folding the net:




Statement 1:

After folding as shown, face Q is at the front and face T is at the bottom. They meet at the lower front edge and at the vertex at each end of this edge.

**Statement 1 is correct.**

Statement 2:

After folding as shown, face P is at the top and face U is on the right. They are next to each other, not opposite each other.

**Statement 2 is incorrect.**

Statement 3:

After folding as shown, face P is at the top, face R is on the left and face U is on the right. Although P and R meet at two vertices (at the top left) and P and U meet at two vertices (at the top right), R and U do not meet at all because they are on opposite sides of the cube.

**Statement 3 is incorrect.**

The correct answer is statement 1 only.

**32** We can check each key in turn.

key 1:  represents 8 goals  represents 4 goals

Since Desmond will only draw whole and half soccer balls and no other fractions of a ball, this key can only represent numbers that can be made by adding 8s and 4s.

| year | number of goals | can be represented using key 1? |
|---|---|---|
| 2023 | 64 = 8 × 8 | yes (8 whole balls) |
| 2024 | 56 = 7 × 8 | yes (7 whole balls) |
| 2025 | 48 = 6 × 8 | yes (6 whole balls) |

**Key 1 is possible.**

key 2:  represents 12 goals  represents 6 goals

This key can only represent numbers that can be made by adding 12s and 6s.

| year | number of goals | can be represented using key 2? |
|---|---|---|
| 2023 | 64 = 60 + 4<br>= 5 × 12 + 4 | no (5 whole balls with 4 goals left over) |
| 2024 | 56 = 48 + 8<br>= 4 × 12 + 6 + 2 | no (4 whole balls and 1 half ball with 2 goals left over) |
| 2025 | 48 = 4 × 12 | yes (4 whole balls) |

**Tip**: When we find that the goals in 2023 cannot be represented, we already know key 2 is not possible. We do not have to check for 2024 and 2025 as well.

**Key 2 is not possible.**

key 3:  represents 16 goals  represents 8 goals

This key can only represent numbers that can be made by adding 16s and 8s.

| year | number of goals | can be represented? |
|---|---|---|
| 2023 | 64 = 4 × 16 | yes (4 whole balls) |
| 2024 | 56 = 48 + 8<br>= 3 × 16 + 8 | yes (3 whole balls and 1 half ball) |
| 2025 | 48 = 3 × 16 | yes (3 whole balls) |

**Key 3 is possible.**

So the correct answer is keys 1 and 3 only.

**33**

| objects under the water | level of water in the jug |
|---|---|
| 2 blocks | 54 mL |
| 1 block and 3 spheres | 54 mL |
| 3 blocks and 3 spheres | 66 mL |

**Tip**: The water level is the level without any objects, plus the increase caused by the objects. So for example, two blocks do not increase the level of water by 54 mL; they raise the water level from its original level to 54 mL.

The last two rows of the table show that adding 2 blocks increases the water level from 54 mL to 66 mL. This is an increase of 66 mL − 54 mL = 12 mL.

If two blocks increase the level by 12 mL, one block increases the level by **6 mL**.

The first two rows of the table show that replacing 1 block by 3 spheres does not change the water level.

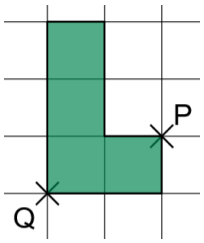
So 3 spheres increase the water level by as much as 1 block, 6 mL, and 1 sphere increases the water level by **2 mL**.

To find the water level when 1 block and 1 sphere are under the water, we can start with 2 blocks in the water (as in the first row of the table), take away a block (**6 mL**) and add a sphere (**2 mL**):

54 mL − **6 mL** + **2 mL** = 50 mL

So the correct answer is **C** 50 mL.

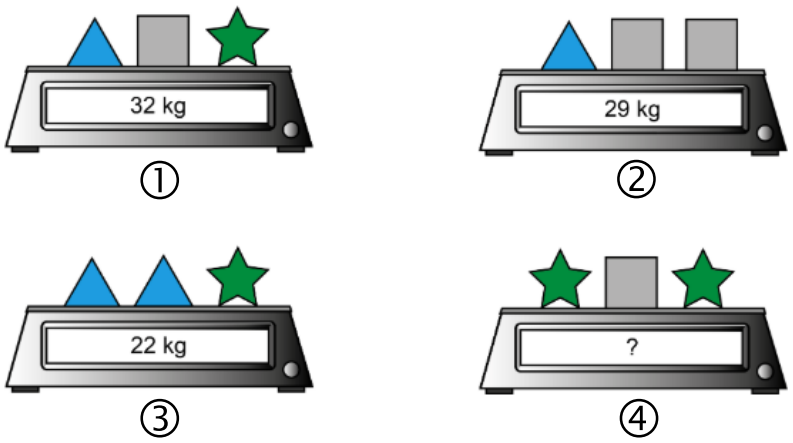
**34** After it is rotated a quarter-turn anti-clockwise, the shape looks like this:




Q is now 2 squares left of P and 1 square below P.
P is now at (6, 3).
2 squares left of (6, 3) is (4, 3).
1 square below that is (4, 2).

So the correct answer is **A** (4, 2).

**35** Here are the four sets of scales with number labels added:




The difference between the objects on scales ① and ③ is that ▢ is replaced with ▲. This decreases the total mass by 10 kg (from 32 kg to 22 kg).

So ▢ is 10 kg heavier than ▲.

The difference between the objects on scales ① and ② is that ★ is replaced with ▢. This decreases the total mass by 3 kg (from 32 kg to 29 kg).

So ★ is 3 kg heavier than ▢.

If ★ is 3 kg heavier than ▢, and ▢ is 10 kg heavier than ▲, then ★ is 13 kg heavier than ▲.

The difference between the objects on scales ① and ④ is that ▲ is replaced with ★. So the total mass increases by 13 kg.

The mass on ④ is 32 kg + 13 kg = 45 kg

> **Tip**: Here is an alternative method.
>
> On ① there is 1 triangle, 1 square and 1 star.
>
> On ②, ③ and ④ there are 3 triangles, 3 squares and 3 stars altogether. This must be 3 times the mass on ①: 3 × 32 kg = 96 kg
>
> Mass on ④ = 96 kg − mass on ② − mass on ③ = 96 kg − 29 kg − 22 kg = 45 kg

So the correct answer is **E** 45 kg.