



Selective High School Placement Test

Reading

Explained answers for the sample test

- 1** The correct answer is **C**. In the third paragraph of Extract A, we're told 'the heat inside the vehicle was oppressive' and the fourth paragraph refers to 'the close air of the coach'. The fourth paragraph of Extract B gives many details about how cramped and uncomfortable the children were on their long journey, squashed together in the back of the car.
- 2** The correct answer is **A**. According to the second paragraph of Extract A, the girls were 'chirping and chattering like budgerigars'. There is no reference in Extract B to any talking among the Law family members – instead we're told that the children would 'nod off' during the journey.
- 3** The correct answer is **B**. In the first paragraph of Extract B, the writer tells us that his family 'isn't the outdoors type' and goes on to say that they dislike camping and prefer theme parks. We're told that the girls in Extract A are excited to be away from College, but we don't know their attitude towards being in natural surroundings.
- 4** The correct answer is **A**. We're told that the girls knew the first part of the journey, up to the clump of wayside willows, 'only too well' as they would be taken there on their daily walks from College, but would not be allowed by their governess to go past this point. On this occasion, they feel 'a sense of adventure' once they have passed the willow trees.
- 5** The correct answer is **C**. Irma asks Mademoiselle if the girls can take their hats off, but it is Miss McCraw who makes the decision, replying, 'Certainly not'.
- 6** The correct answer is **D**. When Irma earlier asked if the girls could remove their hats, she was told this was unacceptable, as they would look like 'street urchins' – an unacceptable standard of appearance. However, when they stop for their picnic, nothing is said to the girls when they remove their hats.
- 7** The correct answer is **D**. The writer says that the family would feel 'an overwhelming sense of wonder' when they saw the rollercoaster, and the writer compares it to 'a strange apparition or a mirage'.
- 8** The correct answer is **B**. The writer mentions that 'Despite being raised on the coast', his family did not like the beach or camping for many reasons. This is in contrast to their clear preference for theme parks. The writer goes into some detail in the first two paragraphs to explain and justify this preference, suggesting that the reader may not share his views.

- 9 The correct answer is **D**. The title 'The Fish' leads grammatically on to the first two lines of the poem, 'wade through black jade', which describe the movement of the fish under the water.
- 10 The correct answer is **C**. One 'of the crow-blue mussel-shells' adjusts the ash-heaps, and opens and shuts itself 'like an injured fan'.
- 11 The correct answer is **B**. The rays ('shafts') of the sun are submerged below the water and illuminate the underwater crevices, lighting up the barnacles.
- 12 The correct answer is **A**. The crabs are 'like' green lilies. This is the only option that uses a simile (indicated by 'like').
- 13 The correct answer is **D**. The cliff has marks from 'dynamite grooves, burns, and hatchet strokes' which, it is suggested, are signs of harm that's been caused by man.
- 14 The correct answer is **C**. Every verse of five lines has the same pattern – it starts with just one syllable, then the number of syllables in each line increases before decreasing again. In the same way, a wave is small at first and increases in size before it breaks and then is drawn back into the sea.
- 15 The correct answer is **C**. Professor Jacquet's group are against farming octopuses. This is because octopuses are 'highly developed... creatures'. As a result, farming them might be stressful for them, causing large numbers of deaths. The next sentence after the gap continues the argument against octopus farming, repeating the idea that sophisticated creatures such as octopuses shouldn't be farmed for food.
- 16 The correct answer is **E**. This answer begins, 'In one such experiment...'. This refers to the 'tests' mentioned in the previous sentence. The 'pieces of coconut shell' are examples of the tools referred to in the previous sentence.
- 17 The correct answer is **A**. This answer mentions 'these dwindling catches'. This refers back to the statement immediately before this gap that the numbers of octopus caught are 'in decline'.

- 18** The correct answer is **G**. This sentence begins with ‘These efforts...’, which refers back to the sentence at the end of the previous paragraph about ways of increasing the numbers of octopus. **G** is about the feeding habits of octopuses. This is linked to the following sentence, which is also about feeding.
- 19** The correct answer is **D**. The word ‘also’ in **D** tells us that one advance has already been mentioned. It links **D** to the previous sentence, which is about an advance in the feeding of young octopuses.
- 20** The correct answer is **F**. This sentence is against octopus farming. The sentence begins ‘But...’ because the previous sentence is giving a positive argument for octopus farming – that it shows signs of being a successful business.
- 21** The correct answer is **D**. In the second sentence, the writer says, ‘...and the dream went lucid; I realized that what was going on was a dream’. The writer was therefore aware of being in a dream.
- 22** The correct answer is **C**. In the second paragraph of the extract, we learn that, ‘like so many other writers (and artists too)’, the writer is involved in creative work, and that he uses images and stories from his dreams to inspire him in this work.
- 23** The correct answer is **A**. In the writer’s dream, a locked and chained gate prevented her from going down the drive. Then suddenly the writer was ‘possessed... with supernatural powers and passed like a spirit through the barrier’.
- 24** The correct answer is **B**. The writer says that the most interesting dreams for other people are those ‘in which you deal with a problem in some new way... you learned something about how to deal with a threat’. So he is saying that in certain circumstances – when we have to deal with a problem – dreams can be useful and teach us how to behave.
- 25** The correct answer is **B**. The writer says that although we think of dreams as being weird, ‘about 80 percent of dreams depict ordinary situations’.
- 26** The correct answer is **C**. The writer says, ‘As a rule, dreams die in the glare of the waking world, their shimmering aura evaporating...’. So as the dreamer awakens, the emotional power of the dream is usually lost.

- 27** The correct answer is **A**. In the writer's dream, the drive was 'narrow and unkempt, not the drive that we had known'. The drive she had known was well looked after, whereas this one had been taken over by nature.
- 28** The correct answer is **D**. When the writer tried to remember the information on the cover of the book he was holding, he found this information kept changing and he was unable to remember it.
- 29** The correct answer is **B**. At the end of this extract the writer says that 'the emotional pull of dreams makes even the strangest incongruities seem 'meaningful and worthy of discussion and interpretation'.
- 30** The correct answer is **C**. The writer's mother told him: 'Don't ever share your dreams with anyone'. She was therefore advising him that he should never recount his dreams to other people.

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Selective High School Placement Test

Mathematical Reasoning

Explained answers for the sample test

- 1 Working with the 24-hour clock and then converting:

One quarter of an hour is 15 minutes.

10 minutes after 1850 is 1900, so 15 minutes after 1850 is 1905.

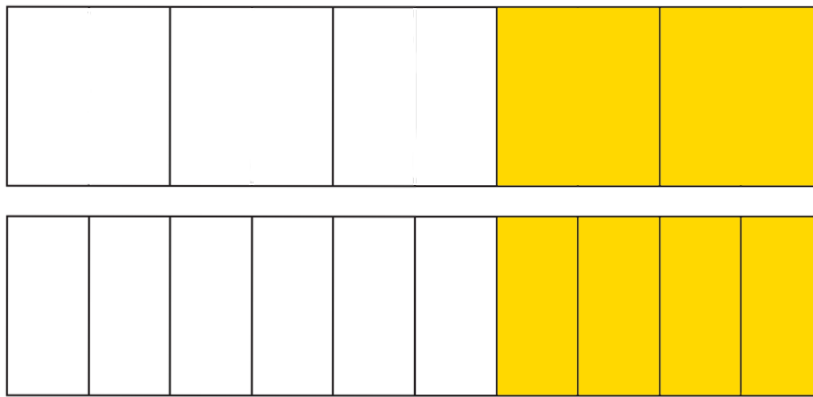
In the 12-hour format, 1905 is 7:05 pm, so the correct answer is **E 7:05 pm**.

Alternatively, converting to the 12-hour clock first:

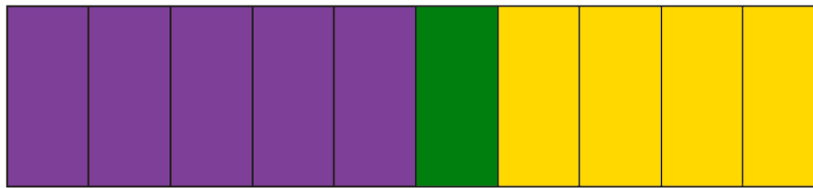
Sandy's watch reads 1850 which is 6 hours after 1200 so it is 6:50 pm.

Adding on 15 minutes takes us to 7:05 pm.

- 2 The wall has ten equal sections. Jack paints $\frac{2}{5}$ of the whole wall yellow; this is the same as $\frac{4}{10}$ so Jack paints 4 sections yellow. The diagram below shows $\frac{2}{5}$ and $\frac{4}{10}$ are equivalent:



Jack paints 5 sections purple and 4 sections yellow. This leaves just one section to be painted green. So Jack paints 1 section green, and the correct answer is **A 1**.



- 3 The smallest four-digit whole number is 1000.
The largest two-digit whole number is 99.

So multiplying the smallest four-digit whole number by the largest two-digit whole number is $1000 \times 99 = 99\,000$. The correct answer is **A 99 000**.

- 4 Reading from the scale, the arrow is halfway between 700 g and 800 g so the jar and cooking sauce together weigh 750 g.

When the jar is empty it weighs 330 g so we need to subtract the weight of the empty jar to find the weight of the sauce. $750 - 330 = 420$ so the weight of the sauce is 420 g.

Rana needs 650 g of sauce. She has 420 g so she needs $650 - 420 = 230$ g more sauce, so the correct answer is **D 230 g**.

- 5 We are trying to make the largest two-digit number we can, so we need to make the tens digit as large as possible.

If we choose a 9 for the 'tens' digit, we can't make a line of symmetry. If we choose an 8 for the 'tens' digit, we need to choose a digit with a horizontal line of symmetry for the 'ones' digit.

1, 3, 8 and 0 are the possible choices. If we choose 8, we would have the number 88, which has two lines of symmetry, so we should choose 3, which gives the correct answer **B 83**.



- 6 Kim's number is a multiple of 5 so it must end with a 5 or a 0. Kim's number is less than 50, so the largest possible value for Kim's number is 45.

Jamie's number is even and is also a multiple of 7. The smallest number greater than zero which is both a multiple of 7 and an even number is 14 because $2 \times 7 = 14$.

So the difference between the largest possible value of Kim's number and the smallest possible value of Jamie's number is $45 - 14 = 31$. The correct answer is **A 31**.

- 7 To find the area of a rectangle, we multiply the length by the width.

Rectangle P has a length of 10 cm and a width of 6 cm so its area is $10 \times 6 = 60 \text{ cm}^2$.

To find the length of rectangle Q, we have to work out what to multiply 4 cm by to give 60 cm^2 . $60 \div 4 = 15$, so $15 \times 4 = 60$. So the length of rectangle Q must be 15 cm, and the correct answer is **C 15 cm**.

- 8 Sooyoung had 250 mL of cordial and drank 10 mL, leaving $250 - 10 = 240$ mL in the glass.

She poured water in up to the 500 mL mark, so she poured in $500 - 240 = 260$ mL of water from the bottle.

The bottle originally contained 1 litre which is 1000 mL, so when she poured out 260 mL, she left $1000 - 260 = 740$ mL of water in the bottle. So the correct answer is **C 740 mL**.

- 9 First, use the fact that $9 \times \square = 108$. We can work out that $\square = 12$, because $9 \times 10 = 90$ and $9 \times 2 = 18$ so $9 \times 12 = 108$ (or by working out that $108 \div 9 = 12$).

Now we know that $\triangle + 12 = 36$ so $\triangle = 36 - 12$, and $\triangle = 24$.

So the correct answer is **C 24**.

- 10 Starting from the middle of the pattern so far, we can look for where the line of symmetry could go. The first chance we have to make the pattern symmetrical is by placing the vertical line of symmetry through the centre of the group of three black tiles:



Tahnee needs to add one black and one white tile to the right of the pattern:



So Tahnee can add on two more tiles, and the correct answer is **A 2**.

Alternatively, we can solve this by starting from the right and working out what tiles to add. Since the first tile is white, the last tile must also be white, but adding one white tile does not give a symmetric pattern. Since the second tile is black, the second-to-last tile must also be black, and that does give a symmetric pattern. So Tahnee can add on two more tiles.

11 The probability that the button is blue is 0.2.

There are twice as many red buttons as blue buttons, so the probability that the button is red must be $0.2 \times 2 = 0.4$.

The probability that the button is green is 0.3.

The probabilities of blue, green, red and yellow have to add up to 1 since those are all the possible outcomes.

$$0.2 + 0.4 + 0.3 = 0.9$$

$$1 - 0.9 = 0.1$$

So the probability that Jessica takes out a yellow button is 0.1, and the correct answer is **A 0.1**.

12 Checking each statement in turn:

1 *June had more than twice as much rainfall as August.*

June's rainfall was 70 mm. August's rainfall was 40 mm.

$40 \times 2 = 80$ and 70 is less than 80, so statement 1 is not correct.

2 *December had 9 cm more rainfall than November.*

December's rainfall was 190 mm.

November's rainfall was 100 mm, so December's rainfall was 90 mm more than November's rainfall.

90 mm = 9 cm, so statement 2 is correct.

3 *The rainfall in February, March and April combined was more than 1 metre.*

February's rainfall was 430 mm. March's rainfall was 440 mm. April's rainfall was 230 mm.

1 metre is 1000 mm, and $430 + 440 + 230 = 1100$ which is greater than 1000, so statement 3 is correct.

Statements 2 and 3 are correct, so the correct answer is **D statements 2 and 3 only**.

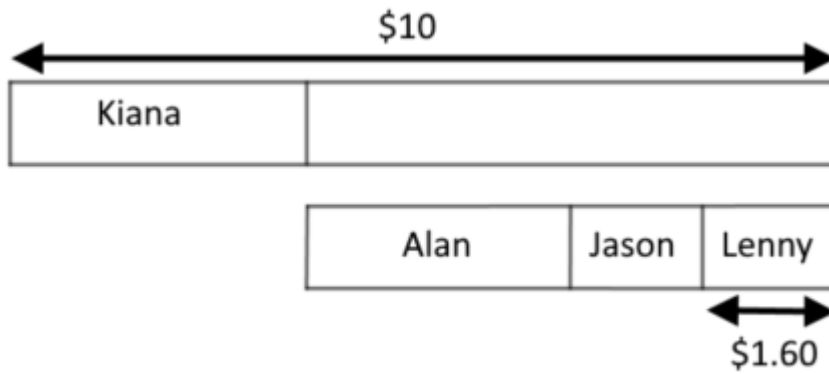
13 We can work backwards:

Lenny received \$1.60 from Jason, which is half of what Jason received, so Jason must have received \$3.20 ($\$1.60 \times 2 = \3.20).

Jason received \$3.20 from Alan, which is half of what Alan had left, so Alan must have had \$6.40 left ($\$3.20 \times 2 = \6.40).

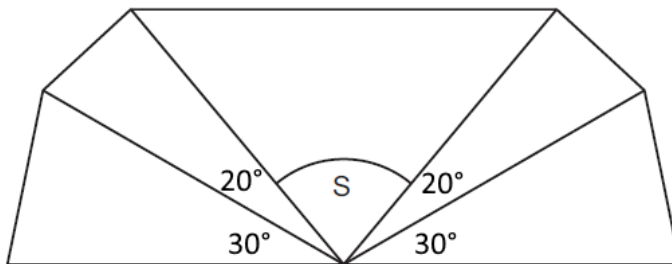
If Alan had \$6.40 left after giving some money to Kiana, he must have given Kiana $\$10 - \$6.40 = \$3.60$. So the correct answer is **B \$3.60**.

Alternatively, we could draw a diagram to help us to work it out:



From the diagram we can see that Alan, Jason and Lenny have $4 \times \$1.60 = \6.40 altogether. So Kiana has $\$10 - \$6.40 = \$3.60$.

- 14** Reading off the protractor, Noah has constructed lines at 30° and then 20° further round at 50° . Since the shape has one line of symmetry, the angles in his shape must be $30^\circ, 20^\circ, S, 20^\circ$ and 30° :



A straight angle is 180° so the missing angle S must be $180^\circ - 20^\circ - 30^\circ - 20^\circ - 30^\circ = 80^\circ$. So the correct answer is **B 80°** .

Alternatively, we could use the line of symmetry to work out that the two lines at each side of S will be at 50° and 130° on the protractor, and $130^\circ - 50^\circ = 80^\circ$.

- 15** If each of the 14 people get 8 chocolates, that is 14×8 chocolates.

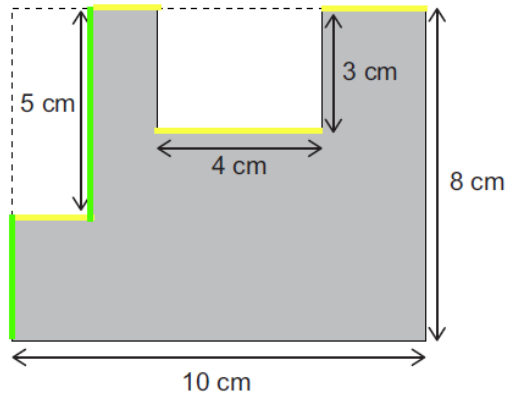
There are 5 chocolates left over, so these are extra chocolates added to the 14×8 , so the total number of chocolates is $14 \times 8 + 5$.

There are 117 chocolates altogether, so the correct answer is **E $14 \times 8 + 5 = 117$** .

Alternatively, 117 chocolates shared between 14 people is represented by the calculation $117 \div 14$. The answer is 8 with a remainder of 5, so 117 must be equal to $14 \times 8 + 5$.

- 16** To find the perimeter, we need to work out the total length of the boundary of the shape.

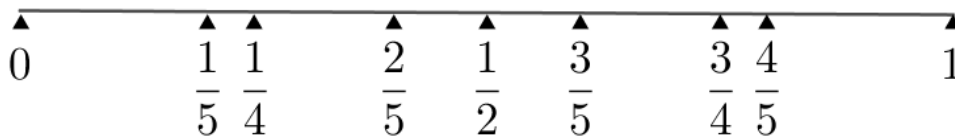
We don't know every length but we do know that the highlighted horizontal lines must add up to 10 cm, and the highlighted vertical lines must add up to 8 cm. Then we need to count the bottom and the right of the shape, and the two sides going down into the top of the shape which are each 3 cm long.



So the total perimeter is $10\text{ cm} + 8\text{ cm} + 10\text{ cm} + 8\text{ cm} + 3\text{ cm} + 3\text{ cm} = 42\text{ cm}$. So the correct answer is **E 42 cm**.

- 17** Andy ate $\frac{1}{5}$ of the bar and Bella ate $\frac{2}{5}$ of the bar, so Carlo must have also eaten $\frac{2}{5}$ of the bar.

This number line shows the position of the relevant fractions:



Checking each statement in turn:

1 Carlo ate less than half of the chocolate bar.

$\frac{2}{5}$ is less than one half, so statement 1 is correct.

2 Andy ate more than one quarter of the chocolate bar.

$\frac{1}{5}$ is less than one quarter, so statement 2 is not correct.

3 Andy and Bella ate less than three quarters of the chocolate bar altogether.

Together, Andy and Bella ate $\frac{3}{5}$ of the chocolate bar, so statement 3 is correct.

So the correct answer is **E statements 1 and 3 only** are correct.

18 Each of the rows, columns and diagonals add up to the same total.

The top row is complete so we can use that to find the total:

$$20 + 15 + 16 = 51.$$

Next we can look at the diagonal shown here with a dotted line:

20	15	16
18		◆

The number in the very centre must be added to $16 + 18$ to give 51, so the number in the centre is $51 - (16 + 18) = 17$.

Finally, using the other diagonal, $20 + 17 + \blacklozenge = 51$, so $\blacklozenge = 51 - (20 + 17) = 14$. So the correct answer is **B 14**.

Here is the completed magic square (although we do not need to work it all out in order to answer the question):

20	15	16
13	17	21
18	19	14

19 Checking each statement in turn:

X *The probability of Emily getting a 4 is $\frac{1}{4}$*

There are four equal sections, one of which is '4', so the probability of Emily getting a 4 when she spins is $\frac{1}{4}$, so statement X is correct. (The outcome of Chen's spin does not affect the outcome of Emily's spin.)

Y *The probability that Emily's number is less than Chen's is $\frac{1}{2}$*

Chen got a 4, so there are two numbers less than Chen's on the spinner (2 and 3).

This means the probability Emily's number is less than Chen's is $\frac{2}{4}$ which is equivalent to $\frac{1}{2}$, so statement Y is correct.

Z The probability that Emily and Chen's scores add up to make more than 5 is $\frac{3}{4}$

Chen got a 4. Here are the possibilities:

Emily gets a 2: total score $4 + 2 = 6$

Emily gets a 3: total score $4 + 3 = 7$

Emily gets a 4: total score $4 + 4 = 8$

Emily gets a 5: total score $4 + 5 = 9$

Whatever score Emily gets, the total will be more than five, so it is certain to happen, so the probability is 1, not $\frac{3}{4}$. So statement Z is incorrect.

So the correct answer is **B statements X and Y only** are correct.

- 20** Each mark on the scale represents 2 kg, because 10 kg is divided into five equal sections, and $10 \div 5 = 2$.

When the scales are empty, the pointer is one mark below 10 kg so the reading is 8 kg.

When the blocks are placed on the scales, the pointer is two marks above 40 kg so the reading is 44 kg.

So the two blocks have a mass of $44 - 8 = 36$ kg.

To find the mass of just one block we need to work out half of 36 kg, which is 18 kg.

So the correct answer is **C 18 kg**.

- 21** Alinta rounds 4 850 000 to the nearest million.

4 850 000 is between 4 000 000 and 5 000 000.

The hundred thousands digit is an 8, so Alinta rounds the number up to 5 000 000.

Tau rounds 4 850 000 to the nearest hundred thousand.

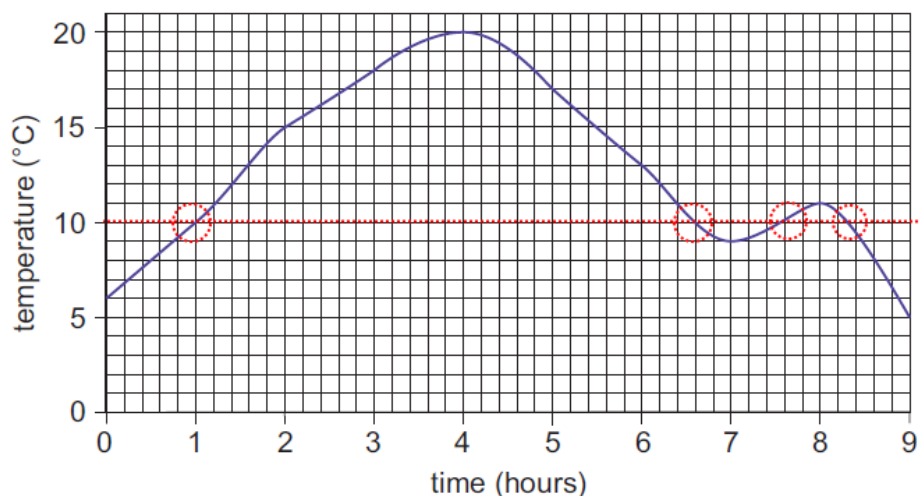
4 850 000 is between 4 800 000 and 4 900 000. The ten thousands digit is a 5, so Tau rounds the number up to 4 900 000.

The difference between their answers is $5\,000\,000 - 4\,900\,000 = 100\,000$, so the correct answer is **C 100 000**.

22 Checking each statement in turn:

1 *The temperature was 10°C at four different times.*

Reading horizontally across from 10, the places where the reading is 10 have been circled. There are four places, so statement 1 is correct.



2 *The temperature change between 1 hour and 3 hours was greater than the temperature change between 4 hours and 6 hours.*

Between 1 hour and 3 hours, the temperature changes from 10°C to 18°C, an increase of 8 degrees. Between 4 hours and 6 hours, the temperature changes from 20°C to 13°C, a decrease of 7 degrees. A change of 8 degrees is greater than a change of 7 degrees. So statement 2 is correct.

3 *The lowest temperature was 5°C.*

At 9 hours, the reading is 5°C. The graph does not go any lower than this at any point, so statement 3 is correct.

The correct answer is **E statements 1, 2 and 3** are all correct.

23 Altogether, Amina, Fred and Sally ate $\frac{4}{5} + 1\frac{1}{5} + \frac{3}{5} = 2\frac{3}{5}$ pizzas. This leaves $1\frac{2}{5}$ for Quoc to eat, which is equivalent to $\frac{7}{5}$. So Quoc eats $\frac{7}{5} - \frac{4}{5} = \frac{3}{5}$ more pizza than Amina, and the correct answer is **B** $\frac{3}{5}$.

Alternatively, we could work it out by thinking about the number of slices. Imagine cutting each of the four pizzas into 5 slices, so there would be $4 \times 5 = 20$ slices altogether, with each slice being $\frac{1}{5}$ of a pizza.

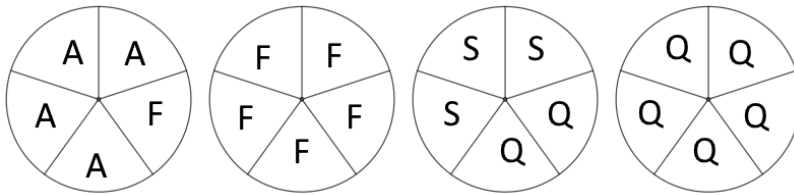
Amina ate $\frac{4}{5}$ of a pizza, which is 4 slices.

Fred ate $1\frac{1}{5}$ of a pizza, which is $5 + 1 = 6$ slices.

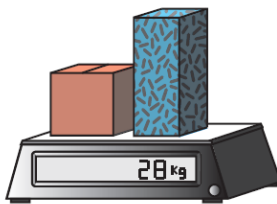
Sally ate $\frac{3}{5}$ of a pizza which is 3 slices.

Altogether they have eaten 13 out of 20 slices, leaving 7 slices for Quoc. This is 3 slices more than Amina ate, which is $\frac{3}{5}$ of a pizza.

We could also show this information using a diagram:



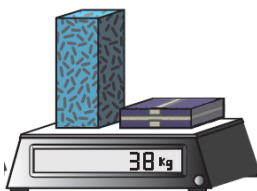
24 Let's label the three boxes 'tall', 'medium' and 'flat'.



This picture tells us that medium + tall = 28 kg.

This picture tells us that medium + flat = 32 kg.

So using both pieces of information together, we can work out that the flat box must be 4 kg heavier than the tall box.



Now we know the flat box is 4 kg heavier, we can work out that two tall boxes would have a mass of 34 kg, and so the tall box has a mass of 17 kg, and the flat box has a mass of 21 kg.

That means the medium box must have a mass of 11 kg, and the total mass of all three is 17 kg + 21 kg + 11 kg = 49 kg.

So the correct answer is **A 49 kg**.

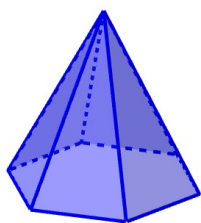
Alternatively, if we add together the measurements from the three weighings, we get 28 kg + 32 kg + 38 kg = 98 kg. However, this includes every box twice, so to work out the mass of the three boxes together, we need to work out $98 \div 2 = 49$.

- 25** A pyramid with a hexagonal base has 1 hexagonal face and six triangular faces, so 7 faces altogether.

The hexagonal base has six vertices, and there is one vertex at the top, so there are 7 vertices altogether.

The hexagonal base has six edges, and then there are six edges joining the vertices at the base to the vertex at the top, so there are 12 edges altogether.

So the sum of the number of faces, edges and vertices is $7 + 7 + 12 = 26$. So the correct answer is **D 26**.



- 26** In the number 30 060, the value represented by the digit 3 is 30 000, and the value represented by the digit 6 is 60, so we need to work out how many times larger 30 000 is than 60.

60 000 is 1 000 times larger than 60, and 30 000 is half of 60 000, so 30 000 is 500 times larger than 60. So the correct answer is **C 500 times**.

Alternatively, $30\,000 \div 60$ is the same as $3000 \div 6$ which is 500.

Or starting from 60 and multiplying:

$$5 \times 60 = 300$$

$$50 \times 60 = 3000$$

$$500 \times 60 = 30\,000$$

So the value represented by the digit 3 is 500 times the value represented by the digit 6.

- 27** When Kylie arrives in New York, the time in Las Vegas is 6 hours after 1300, which is 1900 on Friday. 24 hours is one full day later so when she leaves New York, the time in Las Vegas is 1900 on Saturday.

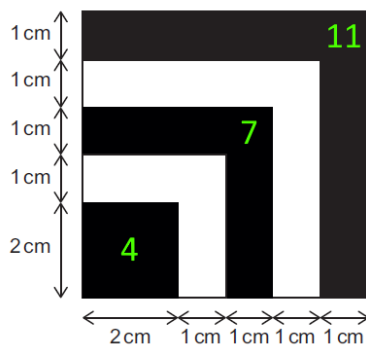
The flight to Sydney is 20 hours; 5 hours would take the time to midnight on Sunday, so the other 15 hours of the flight takes the time in Las Vegas to 1500 Sunday.

However, this is 17 hours behind the time in Sydney, so we need to add 17 hours. Adding 9 hours takes us to midnight on Monday, and then the remaining 8 hours takes us to 0800 Monday. So the time in Sydney when Kylie arrives is Monday at 0800 and the correct answer is **A Monday at 0800**.

Alternatively, Kylie's whole journey is $6 + 24 + 20 = 50$ hours. 50 hours is 2 full days and 2 hours, so the time in Las Vegas when she arrives in Sydney is 1500 on Sunday. Adding on the 17 hour time difference means that the time in Sydney is 0800 on Monday.

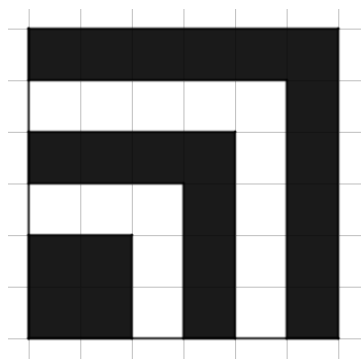
We could also work out the time in Sydney when she leaves. 1300 on Friday in Las Vegas is 17 hours later which is 0600 on Saturday in Sydney. Then adding the 2 days and 2 hours of journey time takes us to 0800 on Monday.

- 28** The black regions are a 2 by 2 square which has area 4 cm^2 and two L shapes with area 7 cm^2 and 11 cm^2 as shown:



So the total area shaded black is $4 + 7 + 11 = 22$, so the correct answer is **D 22 cm^2** .

Alternatively, the whole shape is a 6 by 6 square with area $6 \times 6 = 36 \text{ cm}^2$. The two white areas are 5 cm^2 and 9 cm^2 , so the black area is $36 - 5 - 9 = 22 \text{ cm}^2$.



Or we could imagine a black 6 by 6 square with a white 5 by 5 square on top of it, and a black 4 by 4 square on top of that and so on. Using square numbers, the area is $36 - 25 + 16 - 9 + 4 = 22 \text{ cm}^2$.

- 29** Four marks on the scale is 200 mL, so each mark represents $200 \div 4 = 50$ mL. Looking at the scale, we can see that Jan puts 150 mL of orange juice in the jug.

She adds six times as much apple juice. $6 \times 150 = 900$ mL.

(One way to work this out is to do $6 \times 100 + 6 \times 50$ which is $600 + 300$.)

So in total there is $900 + 150 = 1050$ mL of fruit drink, so the correct answer is

D 1050 mL.

- 30** An equilateral triangle has rotational symmetry of order 3, so it needs to turn through multiples of 120° to fit exactly on itself, because $360 \div 3 = 120$.

The diagram shows how the triangle is transformed by rotating 120° anti-clockwise twice:



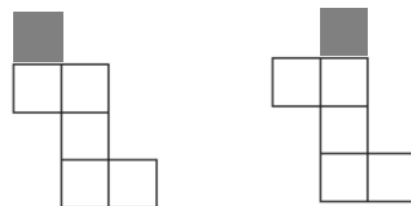
So the final image is after rotating $2 \times 120^\circ = 240^\circ$ anti-clockwise, so the correct answer is **D 240° .**

- 31** If we imagine folding each partial net into a cube, then we can decide whether any faces will overlap or if it's possible to add an extra square to make a complete net.



For drawing 1, the two shaded squares would overlap if we try to fold it into a cube, so the net cannot be completed with a single square.

It is possible to add a square to drawing 2 to make a valid net of a cube:



For drawing 3, as with drawing 1, if we try to fold it into a cube, the two shaded faces will overlap, so it's not possible to add just one more square to make a valid cube net.

So the correct answer is **B drawing 2 only.**

- 32** The perimeter of shape X is equivalent to four times the length of Harry's rectangle and twice the width.

The perimeter of shape Y is equivalent to four times the length of the rectangle and four times the width.

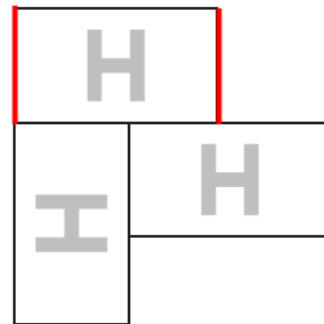
So the difference between the two perimeters is two times the width.

$$82 - 64 = 18$$

$18 \div 2 = 9$. So the width of Harry's rectangle is 9 cm and the correct answer is **E 9 cm**.

Alternatively, we can think about how much the perimeter increases when Harry adds the extra rectangle.

The perimeter added across the top is equivalent to the part of the original perimeter hidden by the extra rectangle, so the only change in perimeter is the two highlighted sections, which is twice the width of the rectangle. So the difference between the original and the new perimeter is twice the width of the rectangle.



- 33** We know that $2 + X + 0 = Y$, and $X + 0 + Y = 6$.

So we need two numbers that add up to 6, with Y two more than X. So X must be 2 and Y must be 4.

Finally, to work out Z, we know that $0 + Y + 6 = Z$ so $Z = 10$. So the correct answer is **C 10**.

Alternatively, we could use trial and improvement.

Let's try the number 1 in position X. Then by adding the numbers three at a time, the sequence would be:

2, 1, 0, 3, 4

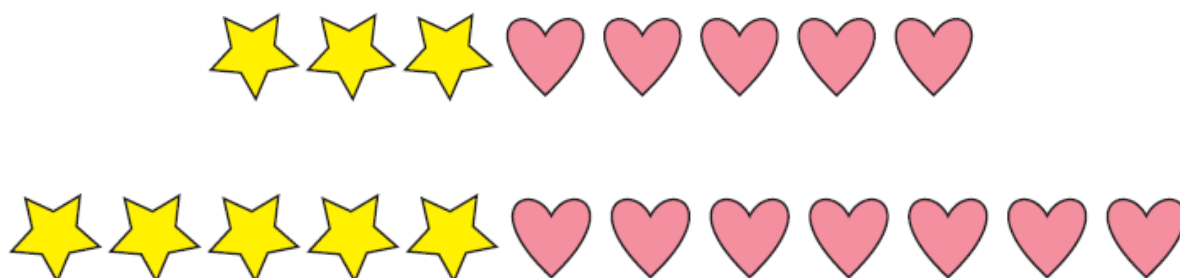
This doesn't work because the number after Y is 6, not 4. So X needs to be bigger.

We could try 2. That would give the sequence:

2, 2, 0, 4, 6, 10

This time, the fifth number is 6 which is what we need. So the sixth number, Z, is 10.

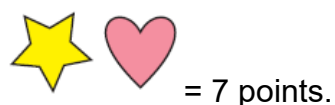
- 34 Looking at the two arrangements of stars and hearts, the second arrangement has two extra stars, and two extra hearts.



The difference between the two totals is $41 - 27 = 14$ points.



One star and one heart must be worth half as much as two stars and two hearts, so



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

- 35 Between 1 and 100 there are 33 multiples of 3, because $3 \times 33 = 99$. However, some of these are multiples of 8.

The multiples of 8 less than 100 which are also multiples of 3 are $3 \times 8 = 24$, $6 \times 8 = 48$, $9 \times 8 = 72$ and $12 \times 8 = 96$.

So there are $33 - 4 = 29$ numbers between 1 and 100 which are multiples of 3 but not multiples of 8. So the correct answer is **D 29**.

Alternatively, $100 \div 3 = 33$ remainder 1, so there are 33 multiples of 3 between 1 and 100.

The lowest common multiple of 3 and 8 is 24.

There are four multiples of 24 between 1 and 100 (24, 48, 72 and 96).

So the remaining 29 multiples of 3 are not multiples of 8.

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Selective High School Placement Test

Thinking Skills

Explained answers for the sample test

1 When Kai rolled a 5, he received 5 marbles from each of Joe and Alice.

When Joe rolled a 2, he gave 2 marbles to each of Kai and Alice.

The outcome of Alice's roll can be worked out by considering any one of the three friends:

After the second roll Kai had 42 marbles. For him to finish with 41 marbles, he must have given 1 marble to Alice as a result of Alice's roll.

After the second roll Joe had 21 marbles. For him to finish with 20 marbles, he must have given 1 marble to Alice as a result of Alice's roll.

After the second roll Alice had 27 marbles, so she must have received 2 marbles as a result of her roll (one from each of Kai and Joe).

Alice must therefore have rolled a 1, which is option **A**.

2 Aida says that one benefit of hobbies is that they help keep you happy and relaxed and that this enables you to study harder. Her argument is strengthened if there is another reason why it would be beneficial for Tom to continue with his hobby of drawing.

If artistic or creative skills are seen as important skills for engineers to have, then continuing with a hobby that practises those skills would be beneficial for Tom, so option **A** strengthens the argument.

3 If the person who stole the money must have had both an opportunity and a motive, then anyone who does not have either of those cannot be the person who stole the money. Option **D** is an example of this.

4 The first digit shown cannot be 0, 1, 3, 4, 5, 7 or 9, as in each of these cases there would be a segment lit up that should not be. It also cannot be 8, as that would require three of the segments not to be working. The numbers shown in the example are therefore 2 and 3, and the faulty segments are:

The vertical segment on the top right.

The vertical segment on the bottom right.

The correct solution is therefore the display of 4 with the two vertical segments on the right not lit. This is option **A**.

5 Sara: If the scores in writing were different, but the scores in reading were the same, then the totals could not be equal. So Sara's statement must be true.

Mila: If the scores in reading were the same, but the scores in writing were different, then the totals could not be equal. So Mila's statement must be true.

Therefore both statements must be true, which is option **C**.

6 Brian is 8 years old, so Eric must also be 8 years old as they are twins.

Lee must be 7 years old as he is 1 year younger than Eric.

Anita must be 10 years old as she is 3 years older than Lee.

So **D** is the correct option.

7 Since 9 of the goats did not have kids, the remaining 236 goats had at least one kid.

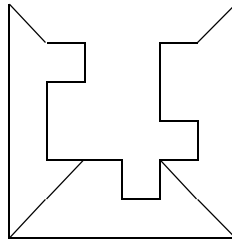
If they had had exactly one kid each, there would have been 236 kids in total, so the remaining $357 - 236 = 121$ kids must have come from goats having two kids each (since none of the goats had more than two kids).

Therefore there were 121 goats that had two kids and $236 - 121 = 115$ goats that had one kid. The correct answer is therefore **A**.

8 Sanjay's argument is that the uneven output from wind farms means that they can never meet our energy needs. If there was a way to store some of the energy generated for the times when the wind turbines are not able to supply enough, then this might not be true. But if storing the energy is not possible, then Sanjay's argument is strengthened, so option **B** is correct.

9 To calculate the number of players who will get prizes, Sam has added the three prizes for positions to the prize that will be given out for a hole-in-one. However, it may be that the player who has scored a hole-in-one finishes in the top three and so receives two of the prizes. The correct answer is **B**.

- 10 No right angles in the shapes are in positions that could be corners of the completed square, so it must be the case that the corners of the square are made by putting two of the 45-degree corners together. The only way that the three pieces could fit together is as shown:



The gap that is left is then filled by option **B**.

- 11 The information in the box tells us that anyone who is not creative or who does not have excellent attention to detail cannot become a successful architect, so Evie's reasoning is correct.

However, the information in the box does not tell us that anyone who is creative and has excellent attention to detail will certainly become a successful architect, so Will's reasoning is incorrect.

The correct answer is therefore **B**.

- 12 The information that is given and refers to positions in the row can be summarised as follows:

Ms White	Mr Green			
	Tennis	Badminton		
Van				

Since Mrs Black likes football, she cannot live in the middle house. Since she lives two houses from Dr Grey, she cannot live in the second house from the right. She must therefore be in the last house on the right, so the correct answer is **C**.

The fully completed table is:

Ms White	Mr Green	Dr Grey	Miss Orange	Mrs Black
Swimming	Tennis	Badminton	Golf	Football
Van	Motorcycle	Taxi	Car	Bicycle

13 The highest two totals for the first two tests are 169 (James) and 160 (Layla). By scoring 100 on the final test, Layla would have a total of 260, so James needs to increase his total to 261 in order to be sure to win the prize. To do this, he needs a score of 92 on the final test, so option **A** is correct.

14 Anh's mother's argument is that banning the cars will help to protect the children from harm. The reasoning given relates to accidents, but if statement **C** is true, then this is another form of harm and so it strengthens the argument.

15 Ferdinand knows that every city is listed in his atlas and so he would be able to look up the country that any city is in. This is only the case if every city name is unique, as otherwise he can only work out which countries contain a city of the given name. The correct answer is therefore **B**.

16 The diagram shows three of the four corners of four copies of the tile. From these tiles it can be seen that each tile must have squares in two of the corners, a triangle in one corner and a quarter-circle in the final corner.

To work out the pattern covered by the rectangle it is necessary to identify which shape is missing from each tile. These are as follows:

Top left: quarter-circle	Top right: triangle
Bottom left: triangle	Bottom right: square

The option that matches this is option **A**.

17 Since Jun is an experienced programmer, he only had to pass the maths test in order to get a place on the course (and the result of the chess challenge was irrelevant in his case). Therefore, he must have failed the maths test since he did not get a place on the course. The correct answer is **C**.

18 Since monotremes are the only type of mammal that lay eggs, it must be the case that any mammal that lays an egg is a monotreme. Therefore, Jack's statement is true.

If an animal that lays an egg is not a monotreme, then it cannot be a mammal, for the same reason. Therefore, Amelia's statement is true.

Both statements are true, so the correct answer is **C**.

- 19** The pass for 4 consecutive days is better value than the pass for 1 day as long as the bus is used on three of the days.

The pass for 7 consecutive days can be ignored as two passes for 4 consecutive days can be used to cover a period of 8 consecutive days for the same price.

There are three points where 3 out of 4 consecutive days are used and 1 additional day.

The cheapest price is to cover days 2, 3, 4 with a 4-day pass for \$10, day 6 is covered with a 1-day pass (\$5), days 10, 11, 12 with a 4-day pass (\$10) and day 14, 15, 16 with a 4-day pass (\$100).

Therefore, the cheapest price is $3 \times \$10 + \$5 = \$35$, which is option **B**.

- 20** The argument is that the falling birth rate in many countries is a concern as it is storing up a problem for the future. The problem in the future will be caused by the larger number of old people needing to be looked after and the smaller number of younger people to do this.

Additionally, older people are living longer, so if their health needs increase as they grow older, then this will add to this problem.

Option **B** therefore strengthens the argument.

- 21** The three factors that need to be considered are:

- Whether Monti slept well.
- Whether Monti is tired at / performs well at the interview.
- Whether Monti is offered the job.

In most cases the outcome is described as a possibility, which means that it will not create any situations that are not possible. However, if Monti was tired at the interview, then he could not get the job, so statement **D** is not possible.

- 22** The lines that are visible in the view from above will be from points/sections where the shape is at its widest.

In options A, C and D you would see 4 points/sections.

The only option where there are exactly 3 such points/sections is option **B**.

- 23** We know that any students who did not perform in the Spring concert will perform in the Autumn concert, but it is possible that some students will be able to perform in both concerts. Statement **A** therefore shows the mistake that Jarrah has made.
- 24** From the information given, anyone who likes volleyball likes skiing and (since they like skiing) they also like cycling, but not gymnastics. It is therefore not possible for someone who likes volleyball to like gymnastics, so statement **D** must be true.
- 25** There are only 2 days on which there will be no performances, so performances will take place on 29 days. The only days on which there is a second performance are the Mondays and Tuesdays: there are 9 of these (the 3rd, 4th, 10th, 11th, 17th, 18th, 24th, 25th, 31st).
The total number of performances will therefore be $29 + 9 = 38$, which is option **A**.
- 26** The argument provides one possible explanation for Brazil's success in producing soccer teams (the large number of very poor areas) and then explains that there is a better explanation (the effect of developing skills through playing futsal). The argument is strengthened by evidence that the existence of very poor areas in itself does not guarantee the levels of success. Option **D** does this by identifying that similar situations exist in other countries, but the success in producing soccer teams does not follow.
- 27** The information in the box tells us that a red light flashing always indicates the processor overheating, but it does not rule out that the processor might overheat without the red light flashing. Yifan's reasoning is therefore incorrect.
No information is given about the meaning of a continuous red light, and nor does it follow from the meaning of a flashing light, so Ria's reasoning is also incorrect.
Neither Yifan's nor Ria's reasoning is correct, which is option **D**.
- 28** In order to identify the orientation of the pattern, think of the pattern as one line, so that there is a corner that can be identified as the starting point for the pattern. Looking at the two patterned squares covered by the stain, the starting points for the pattern are from the same corner. The only option for which this is also the case is option **D**, and it can be easily checked that the offcut would fit the gap if rotated 90 degrees anticlockwise.

- 29** Since Natalie finished second and was not as fast as Hailey, it must be that Hailey was the fastest. Therefore, statement **C** cannot be true.

From the information given, we can deduce the following:

	Ranking based on speed	Number of questions correct
Hailey	1st	2
Gabriella	3rd or 4th	4 or 5
Adam	5th	5
Natalie	2nd	3
Kamilla	3rd or 4th	No information

- 30** To show that the claim is true, it needs to be the case that:

- on every occasion on which STAIN-GONE was used, the stain was removed;
- on every occasion on which the stain was not removed, STAIN-GONE was not used.

We need to know that in the case of item 1, the stain was gone and that in the case of item 4, STAIN-GONE was not used. So (a) and (d) are needed, and the correct answer is **C**.

- 31** The total prices from each shop are as follows:

$$\text{Shop A: (one book at half price)} \quad 3 \times \$24 + \$12 \quad = \$84$$

$$\text{Shop B: (no discounts)} \quad 4 \times \$20 \quad = \$80$$

$$\text{Shop C: (one book free)} \quad 3 \times \$26 \quad = \$78$$

Shop D: (two books at half price.

$$\text{Equivalent to three full price)} \quad 3 \times \$25 \quad = \$75$$

The cheapest option is therefore shop **D**.

- 32** The conclusion of the argument is that getting enough sleep is a key part of being successful. If getting less than seven hours of sleep can reduce people's ability to make good decisions, then this suggests that low amounts of sleep would reduce people's chances of being successful. Option **D** is therefore the correct answer.

- 33** We know that all of the Keentan fans were also fans of Wulijini, and that everyone who liked Wulijini also liked Koolchee. Therefore, the most popular game must be either Koolchee or Buroinjin.

Since none of the Buroinjin fans liked Wulijini, they cannot have liked Keentan either, so Buroinjin fans either only like Buroinjin or like Buroinjin and Koolchee.

Since the most popular game is either Koolchee or Buroinjin, then the people who liked both can be ignored. Since more people only liked Koolchee than those who only liked Buroinjin, Koolchee must be the most popular game. The correct answer is therefore **B**.

- 34** In the chart that was drawn, one of the sections is one quarter of the total. Since there is a section that is smaller and a section that is larger, the section that is one quarter of the total must be either comedy or romance.

The largest section on the pie chart represents more than twice the number in the section that is one quarter of the total. No category has more than twice as many as comedy, so the section that is one quarter of the total must be romance. The other two sections must therefore be fantasy and horror, meaning that comedy is the type of movie that was missed out. This is option **B**.

- 35** The argument is that memorising facts should become a thing of the past as it is now possible to look everything up on the internet. The argument can be weakened by identifying a purpose for memorising facts that is not undermined by the ability to look things up. If it is necessary to have some knowledge in order to make sense of information found online, this would count as such a purpose. Option **C** is therefore the correct answer.

- 36** If I were in Room 2, both statements on the door of Room 2 would be false. But no more than one statement on each door can be false, so I must either be in Room 1 or Room 3.

If I were in Room 1, the second statement on the door of Room 1 would be false, meaning the first statement would have to be true and my name would have to be Aziz. However, this would mean that both statements on the door of Room 3 were false, which is impossible.

Since I cannot be in either Room 1 or Room 2, I must be in Room 3, making **C** the correct answer.

- 37** The 8 dog owners have a total of 16 legs, so the dogs must have a total of $60 - 16 = 44$ legs. Since all dogs have 4 legs, there must be 11 dogs and so there must be 3 dog owners with 2 dogs (11 dogs in total – 8 owners = 3 owners with two dogs).

The number of dog owners with one dog is $8 - 3 = 5$, which is option **C**.

- 38** Lisa has assumed that the fact that six county records were broken means that there were six students who achieved this. However, it may be that some students broke more than one record, in which case fewer than half of the qualifiers could be record-breakers. Option **A** is therefore the correct answer.

- 39** We know that all of the swimmers were fitter than all of the gymnasts.

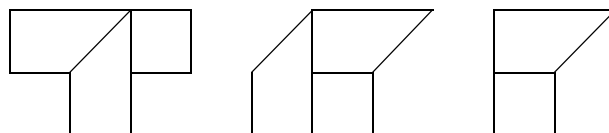
Since the fittest runners were fitter than the fittest swimmers, the fittest of those tested must have been runners.

Since all the gymnasts were fitter than most of the runners, the least fit of those tested must have been runners.

Since the fittest and least fit were all runners, it must be the case that the range of fitness levels was greatest amongst the runners. Option **B** is therefore correct.

- 40** Option **D** only has one of the diagonal sides visible and so cannot be made by putting the shapes together.

The other shapes can be made as follows:



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