

ISEB PRETEST EXTENSION RESOURCE — LEVEL: ADVANCED

Date: _____

- **Accuracy First:** Read each question carefully before choosing your answer.
- **Single Choice:** Choose exactly one correct answer for each question.
- **Pacing:** Work as quickly and as carefully as you can. Do not spend too long on a single question.
- **Omission Rule:** If a question is too difficult, leave it and move forward. You can return to it at the end if you have time.
- **Workspace:** Use the blank space beneath each question to do your working out.

Volume of a Cuboid = length $\times$ width $\times$ height | Probability = $\frac{\text{Number of Favourable Outcomes}}{\text{Total Number of Possible Outcomes}}$

If you write out the prime numbers in order starting from 2, what is the sum of the first five prime numbers?

- A) 26
B) 17
C) 28
D) 25

What number must be added to 5.63 to make exactly 15?

- A) 8.37
B) 9.37
C) 9.47
D) 8.47

Which fraction or percentage is equal to nine-twentieths ($\frac{9}{20}$)?

- A) 4.5% C) 0.045
B) 0.92 D) 45%

Question 4

(1 mark)

What is the difference between the largest number and the smallest number that can be made by changing the order of all the digits in 83,194?

A) 84,942

C) 85,932

B) 83,952

D) 82,962

Question 5

(1 mark)

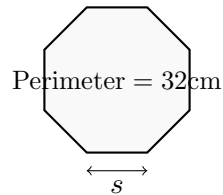
Which number is the lowest common multiple (LCM) of 6, 8, and 12?

- A) 48
B) 36
C) 72
D) 24

Question 6

(1 mark)

The perimeter of a regular octagon is 32cm. What is the length of one of its sides?



- A) 4cm
B) 3cm
C) 6cm
D) 8cm

Question 7

(1 mark)

Given that $P = 8$ and $Q = 4$, what is the value of $5P - 4Q$?

- [illegible]

Question 8

(1 mark)

Oliver buys a folder for £3.20 and a pack of pens for £1.45. He pays with a £10 note. How much change will he receive?

- A) £4.35 C) £5.35
B) £5.45 D) £4.45

Question 9

(1 mark)

A model rocket engine has a starting fuel weight of 160g. The fuel decreases by 20%, and then an extra reserve weight is added which is equal to one-quarter of 64g. What is the final weight of the fuel?

A) 128g

C) 148g

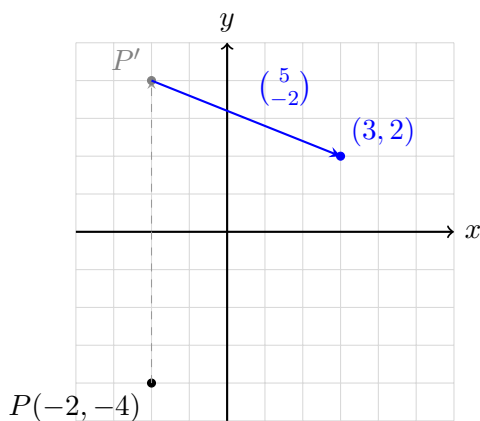
B) 144g

D) 152g

Question 10

(1 mark)

A point on a grid at $(-2, -4)$ is reflected across the x -axis, and then shifted by the vector $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$. What are its new coordinates?

A) $(3, 2)$ C) $(7, 2)$ B) $(3, -6)$ D) $(-7, -6)$

Question 11

(1 mark)

A box contains red, yellow, and blue blocks. One-fifth ($\frac{1}{5}$) of the blocks are blue, and three-quarters ($\frac{3}{4}$) of the remaining blocks are yellow. If there are exactly 12 red blocks, how many blue blocks are in the box?

A) 15

C) 8

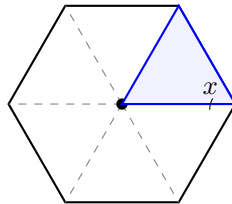
B) 10

D) 12

Question 12

(1 mark)

A regular hexagon is divided into identical triangles that meet at its exact center point. What is the size of the base angle x at the outer edge of one of these triangles?

A) 45° C) 60° B) 30° D) 75°

Question 13

(1 mark)

If $3^{14} \div 3^4 = 3^k \times 3^3$, what is the value of k ?

A) 8

C) 6

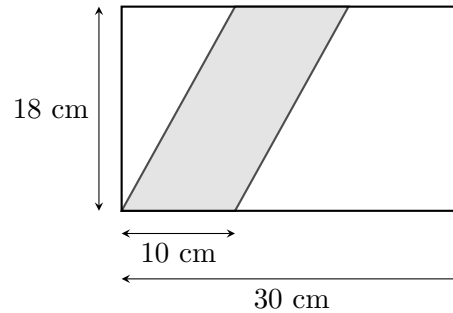
B) 7

D) 10

Question 14

(1 mark)

A large rectangular banner measures 30cm by 18cm. Inside it is a shaded parallelogram. The base of the parallelogram measures 10cm along the bottom edge of the banner, and its top corners touch the top edge of the banner. What is the total area of the parallelogram?



A) 270cm^2

C) 540cm^2

B) 480cm^2

D) 180cm^2

Question 15

(1 mark)

If $4A + 3B = C$ and $12A + 9B + 3C = 48$, what is the value of C ?

A) 6

C) 4

B) 8

D) 12

Question 16

(1 mark)

A wildlife group notices a drop in local hedgehog sightings. This year there are 40% fewer sightings than there were three years ago. If they count 132 sightings this year, how many did they count three years ago?

A) 180

C) 200

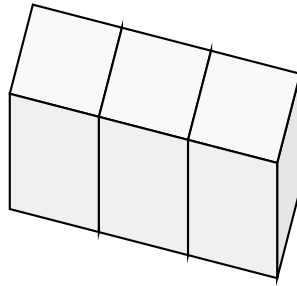
B) 220

D) 240

Question 17

(1 mark)

A large solid shape is made by gluing three identical smaller cubes side-by-side in a straight row. If the total surface area of this new combined shape is 224cm^2 , what is the surface area of one single, separate cube?



A) 96cm^2

C) 72cm^2

B) 84cm^2

D) 108cm^2

Question 18

(1 mark)

Find the next number in this alternating sequence: 3, 6, 7, 12, 11, 18, 15, ...

A) 20

C) 26

B) 22

D) 24

Question 19

(1 mark)

What number must go in the blank space to make this math statement correct? $(8.45 - \text{-----})^3 = 0.5 \times 0.4 \times 40$

A) 6.45

C) 5.25

B) 6.25

D) 5.45

Question 20

(1 mark)

A 4-digit code is made using four unique digits. The digits must strictly decrease from left to right. If the number formed by the code is a multiple of 9, and the first digit is 9 while the last digit is 5, what is the second digit?

- A) 7
B) 8
C) 6
D) 5

Question 21

(1 mark)

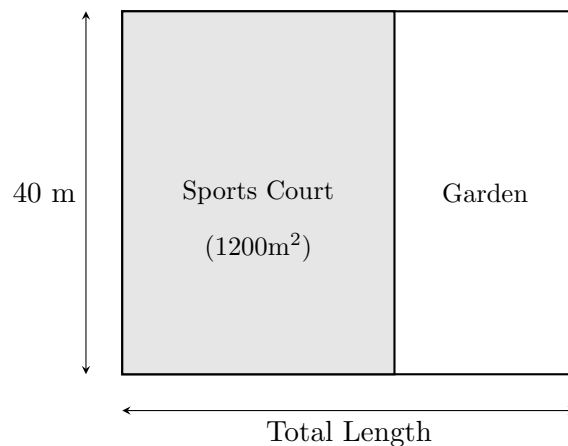
A company uses three sizes of storage boxes. A large box holds b items. A medium box holds 20 fewer items than a large box. A small box holds exactly half the number of items as a medium box. What is the total number of items held by one large, one medium, and one small box added together?

- A) $2.5b - 30$
B) $3b - 40$
C) $2.5b - 20$
D) $2b - 30$

Question 22

(1 mark)

The map of a community center shows a large rectangular yard with a total perimeter of 180m and a width of 40m. The yard is split into a sports court and a garden. The sports court spans the full width of 40m and has an area of 1200m^2 . What is the length of the remaining garden?



- A) 15m
B) 25m
C) 10m
D) 20m

Question 23

(1 mark)

A scientist mixes a liquid solution using 3 parts acid, 4 parts water, and 8 parts saline solution. If the final mixture has exactly 240ml of saline solution, what is the total volume of the entire liquid solution?

A) 480ml

C) 420ml

B) 450ml

D) 510ml

Question 24

(1 mark)

If $\frac{6x-y}{3} = 3x + 2$ and $x = 4$, what is the value of y ?

A) -18

C) 2

B) 6

D) -12

Question 25

(1 mark)

A builder fits square floor tiles together to make a larger rectangle. If you have 12 square tiles, you can arrange them into exactly 3 different-sized rectangles. If you have exactly 40 identical square tiles, how many different-sized rectangles can you make by using all of them?

$$5 \times 8 = 40$$

A) 5

C) 4

B) 6

D) 3

Question 26

(1 mark)

A zookeeper counts a group of 25 animals. The group only contains ostriches (which have 2 legs) and gazelles (which have 4 legs). If the zookeeper counts 74 legs in total, how many ostriches are in the group?

A) 12

C) 11

B) 14

D) 13

Question 27

(1 mark)

In a group of people, half only watch action movies, one-quarter only watch comedies, one-eighth watch both types, and the remaining one-eighth watch neither type. If 36 more people watch only action movies than watch both types, how many people are in the entire group?

A) 96

C) 84

B) 72

D) 108

Question 28

(1 mark)

Drone X and Drone Y take off from the same spot at the exact same time. Drone X flies a 15km path at a speed of 10km/h. Drone Y flies a longer 24km path and finishes its flight at the exact same moment as Drone X. What was the speed of Drone Y?

- | | |
|-----------|-----------|
| A) 15km/h | C) 16km/h |
| B) 14km/h | D) 18km/h |

Question 29

(1 mark)

A quiz has 15 questions. You get 6 points for each correct answer, you lose 3 points for each incorrect answer, and you get 0 points for questions you skip. What is the difference between the highest possible score and the lowest possible score you could get?

- | | |
|--------|--------|
| A) 90 | C) 105 |
| B) 135 | D) 120 |

Question 30

(1 mark)

A toy model tower is one-quarter ($\frac{1}{4}$) the age of a real stone tower spire. In 18 years' time, the real stone tower spire will be exactly 2.5 times as old as the toy model. How old is the toy model right now?

- | | |
|-------------|-------------|
| A) 18 years | C) 12 years |
| B) 15 years | D) 20 years |
-

Question 31

(1 mark)

Which one of the following mathematical statements about whole numbers is completely false?

- A) Multiplying a negative number by another negative number gives a negative answer.
 - B) Adding a negative number and a positive number can give a positive answer.
 - C) Multiplying three negative numbers together always gives a negative answer.
 - D) Multiplying a non-zero number by itself always gives an answer greater than zero.
-

Question 32

(1 mark)

A person puts away £ K into savings each month. After 8 months, they have saved exactly 40% of their total target amount. If $K = 350$, what is their final target savings amount?

- | | |
|-----------|-----------|
| A) £6,000 | C) £7,000 |
| B) £6,500 | D) £7,500 |
-

Question 33

(1 mark)

You are given this list of numbers: $-10, 6, 2, -3, 5$. What is the positive difference between the mean (average) and the median (middle number) of these numbers?

- | | |
|--------|--------|
| A) 1.5 | C) 3.0 |
| B) 2.0 | D) 2.5 |
-

Question 34

(1 mark)

A train journey is split into three equal distance stages. After completing the first stage, the train has been traveling for 30 minutes. The train continues at the same speed for the rest of the trip. What is the total length of time the entire journey takes?

A) 60 minutes

C) 90 minutes

B) 75 minutes

D) 120 minutes

Question 35

(1 mark)

A gardener tests 90 plants. There are 20 more Type-A plants than Type-B plants. At the end of the test, 80% of all 90 plants pass the health test. If exactly 6 Type-B plants fail, how many Type-A plants successfully pass?

A) 44

C) 52

B) 43

D) 46

Question 36

(1 mark)

A money box contains only £5 notes and 20p coins. The total value of all the 20p coins is exactly four times the total value of all the £5 notes. If there are at least four £5 notes inside, what is the minimum total number of items (notes and coins combined) in the box?

A) 405

C) 384

B) 404

D) 420

Solutions

1. **C** — The first five prime numbers are 2, 3, 5, 7, and 11. Adding them together gives $2 + 3 + 5 + 7 + 11 = 28$.
2. **B** — Subtracting the numbers gives $15 - 5.63 = 9.37$.
3. **D** — To convert to a percentage, multiply by 5 on the top and bottom: $\frac{9}{20} = \frac{45}{100} = 45\%$.
4. **A** — The largest number is 98,431 and the smallest is 13,489. Subtracting them gives $98,431 - 13,489 = 84,942$.
5. **D** — The multiples of 12 are 12, 24, 36... $\text{LCM}(6, 8, 12) = 24$.
6. **A** — A regular octagon has 8 equal sides. Side length $= 32\text{cm} \div 8 = 4\text{cm}$.
7. **B** — Putting the values into the statement gives $5(8) - 4(4) = 40 - 16 = 24$.
8. **C** — The total spent is $3.20 + 1.45 = 4.65$. The change is $10.00 - 4.65 = 5.35$.
9. **B** — The fuel drops by 20%, leaving 80%: $160\text{g} \times 0.80 = 128\text{g}$. The extra reserve is $\frac{64\text{g}}{4} = 16\text{g}$. Total fuel $= 128\text{g} + 16\text{g} = 144\text{g}$.
10. **A** — Reflecting $(-2, -4)$ across the x -axis moves it up to $(-2, 4)$. Shifting it by the vector means adding 5 to the x -value and subtracting 2 from the y -value: $(-2 + 5, 4 - 2) = (3, 2)$.
11. **D** — $\frac{1}{5}$ are blue, leaving a remainder of $\frac{4}{5}$. Yellow is $\frac{3}{4} \times \frac{4}{5} = \frac{3}{5}$. Combined blue and yellow is $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$. The red blocks make up the last $\frac{1}{5}$, which equals 12 blocks. Since blue is also $\frac{1}{5}$, there are 12 blue blocks.
12. **C** — A hexagon is made of 6 identical equilateral triangles at the center. The angle inside an equilateral triangle is always 60° .
13. **B** — The left side simplifies to $3^{14-4} = 3^{10}$. The right side is 3^{k+3} . This means $k + 3 = 10$, so $k = 7$.
14. **D** — The area of a parallelogram is base $\times$ height. Here the base is 10cm and the height matches the banner height of 18cm: $10\text{cm} \times 18\text{cm} = 180\text{cm}^2$.
15. **B** — Group the terms structurally: $3(4A + 3B) + 3C = 48 \implies 3C + 3C = 48 \implies 6C = 48 \implies C = 8$.
16. **B** — If sightings dropped by 40%, 60% are left. $60\% = 132 \implies \text{Original count} = 132 \div 0.60 = 220$.
17. **A** — When 3 cubes are glued in a row, 4 touching inner faces are hidden, leaving 14 exposed faces. Area per single face $= 224 \div 14 = 16\text{cm}^2$. An isolated separate cube has 6 faces: $6 \times 16 = 96\text{cm}^2$.
18. **D** — The odd positions add 4 (3, 7, 11, 15...). The even positions add 6 (6, 12, 18 $\implies$ 24).
19. **A** — The right side is $0.5 \times 0.4 \times 40 = 8$. The cube root of 8 is 2, because $2 \times 2 \times 2 = 8$. This means $8.45 - \text{blank} = 2$, so the answer is 6.45.

20. **A** — The four-digit code is strictly decreasing, starting with 9 and ending with 5 (9_5). The digits must sum to a multiple of 9. The remaining choices that strictly fit between 9 and 5 are 8, 7, or 6. Testing $9 + 8 + 6 + 5 = 28$ (no), $9 + 7 + 6 + 5 = 27$ (yes). The unique sequence is 9765, so the second digit is 7.
21. **A** — Large = b , Medium = $b - 20$, Small = $0.5(b - 20) = 0.5b - 10$. Adding them up: $b + b - 20 + 0.5b - 10 = 2.5b - 30$.
22. **D** — A perimeter of 180m with two widths of 40m leaves a total length of $180 - 80 = 100$ m, so each long side is 50m. The court has an area of $1200\text{m}^2 \div 40\text{m} = 30\text{m}$ in length. The garden length is $50\text{m} - 30\text{m} = 20\text{m}$.
23. **B** — Total mixture parts = $3 + 4 + 8 = 15$ parts. Saline is 8 parts = 240ml $\implies$ 1 part = 30ml. Total volume = $15 \times 30 = 450$ ml.
24. **A** — Substitute $x = 4$: $\frac{6(4)-y}{3} = 3(4) + 2 \implies \frac{24-y}{3} = 14 \implies 24 - y = 42 \implies y = -18$.
25. **C** — Factor combinations for 40 blocks are: 1×40 , 2×20 , 4×10 , and 5×8 . This makes exactly 4 different rectangles.
26. **D** — Let o be ostriches and g be gazelles. $o + g = 25$, $2o + 4g = 74 \implies 2g = 24 \implies g = 12 \implies o = 13$.
27. **A** — Let the total be x . $\frac{1}{2}x - \frac{1}{8}x = 36 \implies \frac{3}{8}x = 36 \implies x = 96$.
28. **C** — The flight time for Drone X is $15 \div 10 = 1.5$ hours. The speed for Drone Y is $24\text{km} \div 1.5\text{hours} = 16\text{km/h}$.
29. **B** — The highest score is $15 \times 6 = 90$. The lowest score is $15 \times (-3) = -45$. The difference is $90 - (-45) = 135$.
30. **A** — Let the model age be M . $4M + 18 = 2.5(M + 18) \implies 4M + 18 = 2.5M + 45 \implies 1.5M = 27 \implies M = 18$ years.
31. **A** — Multiplying a negative number by another negative number always gives a positive answer (e.g., $-2 \times -3 = +6$). Therefore, statement A is completely false.
32. **C** — Saved amount after 8 months = $8 \times 350 = 2,800$. Target amount = $2800 \div 0.40 = 7,000$.
33. **B** — Sorted array: $-10, -3, 2, 5, 6$. Median = 2. Mean = $0 \div 5 = 0$. Absolute difference = $|0 - 2| = 2$.
34. **C** — A journey split into three equal stages means 3 parts. One stage takes 30 minutes, so the whole journey takes $30 \times 3 = 90$ minutes.
35. **B** — There are 55 Type-A and 35 Type-B plants. Passing total = $90 \times 0.80 = 72$. Passing Type-B = $35 - 6 = 29$. Passing Type-A = $72 - 29 = 43$.
36. **B** — Four £5 notes equal £20. The coin value must be $4 \times 20 = 80$. The number of 20p coins needed is $80 \div 0.20 = 400$ coins. Total count of items = $400 + 4 = 404$ items.