

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 *after* the number 11?

- A) 97
B) 101
C) 89
D) 103

What number must be added to 6.38 to make exactly 20?

- A) 13.72 C) 14.62
B) 13.62 D) 14.72

Which fraction or percentage is equal to eleven-twentieths ($\frac{11}{20}$)?

- A) 5.5% C) 55%
- B) 0.51 D) 0.055

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 74,269?

A) 72,963

C) 74,943

B) 73,953

D) 71,973

Question 5

(1 mark)

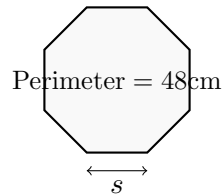
Which number is the lowest common multiple (LCM) of 4, 9, and 15?

- A) 180
B) 90
C) 60
D) 120

Question 6

(1 mark)

The perimeter of a regular octagon is 48cm. What is the length of one of its sides?



- A) 8cm
B) 4cm
C) 6cm
D) 7cm

Question 7

(1 mark)

Given that $P = 9$ and $Q = 6$, what is the value of $6P - 5Q$?

- A) 24
B) 18
C) 34
D) 22

Question 8

(1 mark)

Amelia buys a notebook for £4.15 and a pack of highlighters for £2.60. She pays with a £10 note. How much change will she receive?

- A) £3.35 C) £4.25
B) £3.25 D) £4.35

Question 9

(1 mark)

A remote-control car model has a starting battery reserve of 180 units. The reserve decreases by 15%, and then an extra boost line adds an amount equal to one-third of 72 units. What is the final battery reserve value?

A) 177 units

C) 173 units

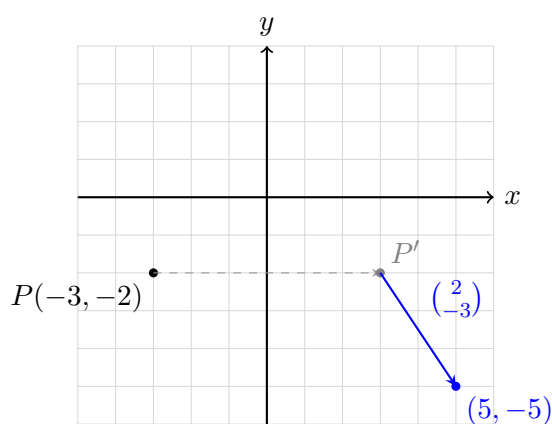
B) 153 units

D) 181 units

Question 10

(1 mark)

A point on a grid at $(-3, -2)$ is reflected across the y -axis, and then shifted by the translation vector $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$. What are its new coordinates?

A) $(-1, -5)$ C) $(5, 1)$ B) $(5, -5)$ D) $(-1, 1)$

Question 11

(1 mark)

A bag contains red, green, and purple tokens. One-quarter ($\frac{1}{4}$) of the tokens are red, and two-thirds ($\frac{2}{3}$) of the remaining tokens are green. If there are exactly 15 purple tokens, how many red tokens are in the bag?

A) 20

C) 15

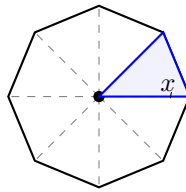
B) 30

D) 25

Question 12

(1 mark)

A regular octagon is divided into 8 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) 67.5° C) 52.5° B) 45° D) 60°

Question 13

(1 mark)

If $5^{18} \div 5^6 = 5^m \times 5^4$, what is the value of the exponent m ?

A) 9

C) 10

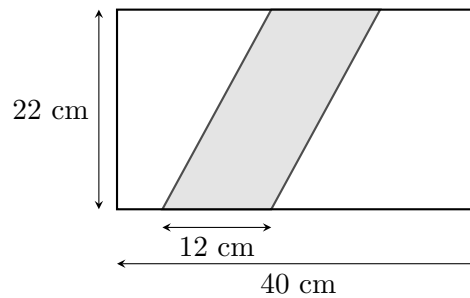
B) 12

D) 8

Question 14

(1 mark)

A large rectangular whiteboard measures 40cm by 22cm. Inside it is a shaded parallelogram drawing. The base of the parallelogram measures 12cm along the bottom edge of the board, and its top corners touch the top edge of the board. What is the total area of the parallelogram?



A) 440cm^2

C) 880cm^2

B) 264cm^2

D) 528cm^2

Question 15

(1 mark)

If $5X + 2Y = Z$ and $15X + 6Y + 4Z = 56$, what is the value of Z ?

A) 8

C) 9

B) 6

D) 7

Question 16

(1 mark)

A sanctuary records a drop in migratory bird nests. This year there are 30% fewer nests than there were five years ago. If they count 189 active nests this year, how many did they count five years ago?

A) 250

C) 270

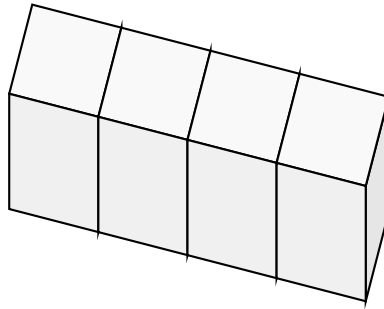
B) 280

D) 240

Question 17

(1 mark)

A solid block shape is made by gluing four identical smaller cubes side-by-side in a single straight row. If the total surface area of this new combined shape is 270cm^2 , what is the surface area of one single, separate cube?



A) 90cm^2

C) 72cm^2

B) 108cm^2

D) 96cm^2

Question 18

(1 mark)

Find the next number in this alternating tracking sequence: 4, 7, 9, 12, 14, 17, 19, ...

A) 21

C) 22

B) 23

D) 24

Question 19

(1 mark)

What number must go in the blank space to make this statement correct? $(9.85 - \text{-----})^3 = 0.8 \times 0.5 \times 67.5$

A) 6.85

C) 5.85

B) 7.15

D) 6.55

Question 20

(1 mark)

A 4-digit security 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 7 while the last digit is 1, what is the second digit?

- A) 5
B) 6
C) 4
D) 3

Question 21

(1 mark)

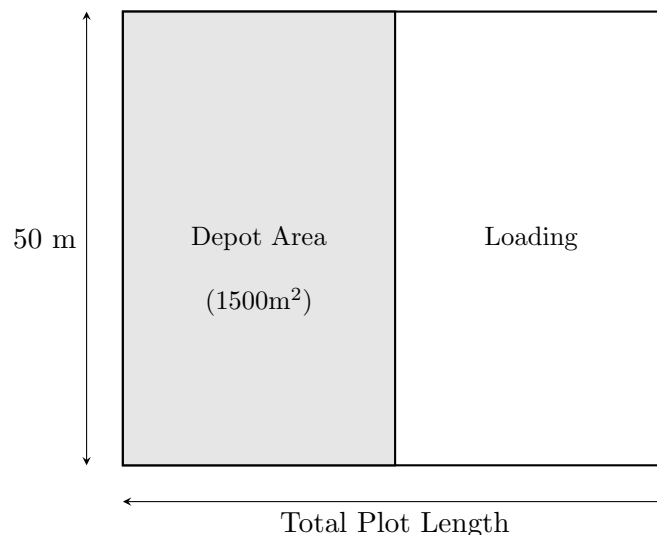
A farmer organizes fruit yields using three container packages. A large box holds c apples. A medium box holds 15 fewer apples than a large box. A small box holds exactly one-third ($\frac{1}{3}$) of the number of apples as a medium box. What expression matches the total number of apples held by one large, one medium, and one small box added together?

- A) $2.33c - 20$
B) $2.5c - 30$
C) $2.33c - 15$
D) $3c - 25$

Question 22

(1 mark)

A schematic map of a warehouse yard shows a large rectangular plot with a total perimeter of 220m and a uniform height width line of 50m. It is divided into a storage depot and a loading bay. The storage depot spans the full width of 50m and has an area of 1500m^2 . What is the remaining baseline length of the loading bay?



- A) 25m
B) 30m
C) 40m
D) 35m
-

Question 23

(1 mark)

A juice blend recipe mixes 2 parts ginger concentrate, 5 parts apple juice, and 9 parts sparkling water. If the beverage maker uses exactly 15 litres of apple juice, how much total blended volume weight mixture do they create?

A) 45 litres

C) 48 litres

B) 42 litres

D) 51 litres

Question 24

(1 mark)

If $\frac{8a-b}{4} = 2a + 3$ and $a = 5$, what is the verified value of b ?

A) -8

C) 6

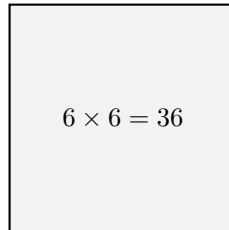
B) -12

D) 4

Question 25

(1 mark)

A stone packer forms grid layouts by grouping unit square blocks together. If 12 individual unit square blocks can be patterned into exactly 3 structurally unique rectangular shapes, how many unique rectangular shapes can be formed using exactly 36 unit blocks?



A) 4

C) 5

B) 6

D) 3

Question 26

(1 mark)

An animal park keeper counts a mixed herd of 30 creatures containing only ducks (2 legs) and sheep (4 legs). If the total number of legs counted across the pasture fields is 94, how many ducks are in the herd?

A) 14

C) 13

B) 16

D) 12

Question 27

(1 mark)

In a demographic group, half only speak French, one-quarter only speak German, one-eighth speak both, and the remaining eighth speak neither language. If 27 more participants speak only French than speak both, how many speak neither language?

A) 12

C) 9

B) 8

D) 15

Question 28

(1 mark)

Drone A and Drone B launch from base station Alpha at the same moment. Drone A flies a short patrol path of 18km at a speed of 12km/h. Drone B flies a longer path of 30km and lands back at station Alpha at the exact same moment as Drone A. What was Drone B's flight speed?

- | | |
|-----------|-----------|
| A) 18km/h | C) 22km/h |
| B) 16km/h | D) 20km/h |

Question 29

(1 mark)

A testing matrix contains a series of assessments. A correct answer scores 5 points, an incorrect answer scores -2 , and skipping scores 0. If a candidate attempts a 20-item deck, what is the maximum range span between the absolute highest and lowest possible scores?

- | | |
|--------|--------|
| A) 120 | C) 100 |
| B) 140 | D) 160 |

Question 30

(1 mark)

A high-rise tower model is one-fifth the height of the primary design spire. In 16 years' time, the design spire layout will be exactly 3 times as tall as the tower model. How old is the tower model right now?

- | | |
|-------------|-------------|
| A) 10 years | C) 8 years |
| B) 12 years | D) 16 years |
-

Question 31

(1 mark)

Which one of the following mathematical inequalities involving integers is completely false?

- A) Multiplying an odd negative integer by an even negative integer yields a negative result.
 - B) The difference between a negative integer and a positive integer can be positive.
 - C) The square of any non-zero integer is always strictly greater than zero.
 - D) Cubing a negative number always outputs a negative integer value.
-

Question 32

(1 mark)

An investment fund allocates £K every month. After 9 months, the platform has tracked exactly 45% of the final target allocation. If $K = 400$, what is the total target fund price?

- | | |
|-----------|-----------|
| A) £7,500 | C) £8,500 |
| B) £8,000 | D) £9,000 |
-

Question 33

(1 mark)

Given the structured data set array: $-12, 7, 3, -4, 6$. What is the absolute positive difference between the calculated mean and the sorted median of these numbers?

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

Question 34

(1 mark)

A long-distance train journey is split into four equal distance stages. After completing the first stage, the train has been traveling for 25 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) 90 minutes | C) 120 minutes |
| B) 100 minutes | D) 75 minutes |

Question 35

(1 mark)

80 plants undergo a controlled botanical growth test. There are 16 more type-A specimens than type-B specimens. At the final review, 85% of all specimens pass the maturity scale. If 4 type-B specimens fail, how many type-A specimens successfully pass the verification threshold?

- | | |
|-------|-------|
| A) 40 | C) 42 |
| B) 44 | D) 38 |

Question 36

(1 mark)

A safety box contains exclusively £5 notes and 20p coins. The total monetary value of the 20p coins is exactly three times the total value of the £5 notes. If there are at least 5 of each item format inside, what is the minimum total number of items inside the box?

- | | |
|--------|--------|
| A) 380 | C) 400 |
| B) 375 | D) 385 |

Solutions

1. **B** — The first few prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29. The next five *after* 11 are 13, 17, 19, 23, and 29. Adding them gives $13 + 17 + 19 + 23 + 29 = 101$. Correct option is B.
2. **B** — Subtracting the decimal gives $20 - 6.38 = 13.62$.
3. **C** — To convert to a percentage, multiply by 5 on the top and bottom: $\frac{11}{20} = \frac{55}{100} = 55\%$.
4. **A** — The largest number is 97,642 and the smallest is 24,679. Subtracting them gives $97,642 - 24,679 = 72,963$.
5. **A** — Multiples of 15 are 15, 30, 45... The first multiple divisible by both 4 and 9 is 180. $\text{LCM}(4, 9, 15) = 180$.
6. **C** — A regular octagon has 8 identical side lengths. Side length $= 48\text{cm} \div 8 = 6\text{cm}$.
7. **A** — Substituting the values gives $6(9) - 5(6) = 54 - 30 = 24$, which corresponds to Option A.
8. **B** — Total spent equals $4.15 + 2.60 = 6.75$. The change is $10.00 - 6.75 = 3.25$.
9. **A** — The battery reserve drops by 15%, leaving 85%: $180 \times 0.85 = 153$ units. The extra boost adds $\frac{72}{3} = 24$ units. Total reserve $= 153 + 24 = 177$ units.
10. **B** — Reflecting $(-3, -2)$ across the y -axis changes the sign of the x -coordinate, moving it to $(3, -2)$. Shifting it by the vector means adding 2 to the x -value and subtracting 3 from the y -value: $(3 + 2, -2 - 3) = (5, -5)$.
11. **C** — $\frac{1}{4}$ are red, leaving a remainder of $\frac{3}{4}$. Green tokens are $\frac{2}{3} \times \frac{3}{4} = \frac{1}{2}$. Combined red and green is $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$. The last $\frac{1}{4}$ must be the 15 purple tokens. Since red is also $\frac{1}{4}$, there are 15 red tokens.
12. **A** — The central angle of a regular octagon slice is $360^\circ \div 8 = 45^\circ$. The two base angles of the isosceles triangle are equal and sum to $180^\circ - 45^\circ = 135^\circ$. Therefore, one base angle $x = 135^\circ \div 2 = 67.5^\circ$.
13. **D** — The left side simplifies to 5^{12} . The right side is 5^{m+4} . This means $m + 4 = 12$, so $m = 8$.
14. **B** — The area of a parallelogram is calculated using $\text{base} \times \text{height} = 12\text{cm} \times 22\text{cm} = 264\text{cm}^2$.
15. **A** — Group terms structurally: $3(5X + 2Y) + 4Z = 56 \implies 3Z + 4Z = 56 \implies 7Z = 56 \implies Z = 8$.
16. **C** — If nests dropped by 30%, 70% are left active. $70\% = 189 \implies \text{Original count} = 189 \div 0.70 = 270$.
17. **A** — Gluing 4 cubes in a row hides 6 touching faces ($3 \text{ internal seams} \times 2 \text{ hidden faces per seam}$). This leaves $24 - 6 = 18$ exposed faces total. Area per surface face $= 270 \div 18 = 15\text{cm}^2$. A single, isolated separate cube has 6 faces: $6 \times 15 = 90\text{cm}^2$.
18. **C** — Odd positions add 5 (4, 9, 14, 19...). Even positions add 5 (7, 12, 17 $\implies$ 22).
19. **A** — The right side evaluates to $0.8 \times 0.5 \times 67.5 = 27$. The cube root of 27 is 3, because $3 \times 3 \times 3 = 27$. This means $9.85 - \text{blank} = 3$, so the answer is 6.85.

20. **B** — The four-digit code is strictly decreasing, starting with 7 and ending with 1 (7__1). The digits must sum to a multiple of 9. The middle two digits must be chosen from $\{6, 5, 4, 3, 2\}$. The sum of the known digits is $7 + 1 = 8$, so the middle two digits $(x + y)$ must add up to 10 to reach a total sum of 18 (the only possible multiple of 9 here). The only unique, decreasing pair from our choices that adds up to 10 is 6 and 4 ($6 + 4 = 10$). This gives the unique code 7641, so the second digit is 6.
21. **A** — Large = c , Medium = $c - 15$, Small = $\frac{c-15}{3} = 0.33c - 5$. Adding them all together: $c + c - 15 + 0.33c - 5 = 2.33c - 20$.
22. **B** — Yard total perimeter is 220m. Two widths of 50m account for 100m, leaving a total combined length of $220 - 100 = 120$ m. Each long side is 60m. The storage depot takes up $1500\text{m}^2 \div 50\text{m} = 30$ m in length. The loading bay length is $60\text{m} - 30\text{m} = 30$ m.
23. **C** — Total mixture parts = $2 + 5 + 9 = 16$ parts. Apple juice accounts for 5 parts = 15 litres $\implies$ 1 part = 3 litres. Total blended volume = $16 \times 3 = 48$ litres.
24. **B** — Substitute $a = 5$: $\frac{8(5)-b}{4} = 2(5) + 3 \implies \frac{40-b}{4} = 13 \implies 40 - b = 52 \implies b = -12$.
25. **C** — Factor combinations for 36 blocks are: 1×36 , 2×18 , 3×12 , 4×9 , and 6×6 . This makes exactly 5 structurally unique rectangles.
26. **C** — Let d be ducks and s be sheep. $d + s = 30$, $2d + 4s = 94 \implies 2s = 34 \implies s = 17 \implies d = 13$.
27. **C** — Let the total be x . $\frac{1}{2}x - \frac{1}{8}x = 27 \implies \frac{3}{8}x = 27 \implies x = 72$. The number of people who speak neither language is $\frac{1}{8} \times 72 = 9$.
28. **D** — Flight time for Drone A is $18\text{km} \div 12\text{km/h} = 1.5$ hours. Speed for Drone B is $30\text{km} \div 1.5\text{hours} = 20\text{km/h}$.
29. **B** — Highest score is $20 \times 5 = 100$. Lowest score is $20 \times (-2) = -40$. The range span is $100 - (-40) = 140$.
30. **C** — Let the model age be M . The spire age is $5M$. In 16 years: $5M + 16 = 3(M + 16) \implies 5M + 16 = 3M + 48 \implies 2M = 32 \implies M = 16$ years old.
31. **A** — An odd negative integer multiplied by an even negative integer always evaluates to a positive product (e.g., $-3 \times -2 = 6$), making statement A completely false.
32. **B** — Saved amount after 9 months = $9 \times 400 = 3,600$. Target fund valuation = $3600 \div 0.45 = 8,000$.
33. **B** — Sorted array: $-12, -4, 3, 6, 7$. Median = 3. Mean evaluation metric = $0 \div 5 = 0$. Absolute difference scale value = $|0 - 3| = 3$, which corresponds to Option B.
34. **B** — A journey split into four equal stages means 4 parts total. One stage takes 25 minutes, so the whole journey takes $25 \times 4 = 100$ minutes.
35. **A** — The total number of plants is 80 ($A + B = 80$) and $A - B = 16$, which yields $A = 48$ and $B = 32$. Total number of passing plants = $80 \times 0.85 = 68$. If exactly 4 Type-B plants fail, the number of passing Type-B plants is $32 - 4 = 28$. Therefore, the number of passing Type-A plants is $68 - 28 = 40$, which corresponds to Option C.

36. **A** — Minimum parameters call for 5 £5 notes (£25). Coin value requirement balance scale = $3 \times 25 = 75$. 20p coin counts required = $75 \div 0.20 = 375$ coins. Total item count = $375 + 5 = 380$ items.