

12 483

13 18

14 10

15 33

Section 2 : Section B Integers - 10 Questions

16 83

17 147

18 20

19 4

20 4

21 46

22 28

23 7

24 50

25 21

TEST

AMO Grade 5 Mock Test Paper 3

SOLUTIONS

SECTIONS

1. Section A MCQs - 15 Questions
2. Section B Integers - 10 Questions

Section 1 : Section A MCQs - 15 Questions

1

The difference between the first term in the first group and the last term in the second group is $115 - 105 = 10$.

The difference between the second term of the first group and the second last term of the second group is also $114 - 104 = 10$.

This pattern continues for each of the rest of the term pairs. There are five pairs whose difference is 10, therefore the value is $5 \times 10 = 50$.

2

Reorder and insert parentheses to show grouping: $(2 \times 5) \times (4 \times 25) \times (3 \times 12) = 10 \times 100 \times 36 = 36000$.

N has **5 digits**.

3

Notice that $10 \times 1 = 1 \times 10$, $9 \times 2 = 2 \times 9$, $8 \times 3 = 3 \times 8$, $7 \times 4 = 4 \times 7$ and $6 \times 5 = 5 \times 6$. Thus all 10 products have a sum of **0**.

4

Consider the hundreds digit to be 1. The product of the last two digits has to be 6. Since $2 \times 3 = 6$, the least 3-digit odd number must be **123**.

5

Draw a model.

Sally:	1 unit			
Jonathan:	1 unit	1 unit	1 unit	\$134

Total: 710

$$4 \text{ units} + 134 = 710$$

$$1 \text{ unit} = (710 - 134) \div 4 = 144$$

$$\text{Jonathan received } 144 \times 3 + 134 = \mathbf{566}.$$

6

The word "of" means multiply in this case.

After the game store, Amy left $\frac{3}{4}$ of the cash in her wallet.

After the clothing store, she left $\frac{3}{4} \times \frac{1}{3} = \frac{1}{4}$ of the cash in her wallet.

After lunch, she left $\frac{1}{4} \times \frac{2}{3} = \frac{1}{6}$ of the cash in her wallet.

After the shoe store, she left $\frac{1}{6} \times \frac{1}{4} = \frac{1}{24}$ of the cash in her wallet.

$\frac{1}{24}$ of the cash in her wallet is equal to \$10. So, Amy had $\$10 \times 24 = \mathbf{\$240}$ at first.

7

Let the smallest of these three consecutive numbers be 1 unit.

Then the second and third numbers are (1 unit + 1) and (1 unit + 2), respectively.

It is given that

$$1 \text{ unit} + (1 \text{ unit} + 1) + (1 \text{ unit} + 2) = (1 \text{ unit} + 2) + 443$$

$$3 \text{ units} + 3 = 1 \text{ unit} + 445$$

$$3 \text{ units} - 1 \text{ unit} = 445 - 3$$

$$2 \text{ units} = 442$$

$$1 \text{ unit} = \mathbf{221}.$$

8

Notice that

$$1^{\text{st}} \text{ number: } 7 \times 1 + 10 = 17$$

$$2^{\text{nd}} \text{ number: } 7 \times 2 + 10 = 24$$

$$3^{\text{rd}} \text{ number: } 7 \times 3 + 10 = 31 \text{ and so on.}$$

$$\text{Thus, the } 100^{\text{th}} \text{ number is } 7 \times 100 + 10 = \mathbf{710}.$$

9

The sum of the numbers in the magic square is $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 = 81$. Hence the sum of the numbers in each row, column and diagonal is $81 \div 3 = 27$.

The number in the bottom right square is $27 - 13 - 3 = 11$ and the number in the middle square is $27 - 5 - 13 = 9$. Thus, the number A in the top left square is $27 - 11 - 9 = 7$.

10

Let the number be 5 units. Then

$$52 + \frac{2}{5} \text{ of } 5 \text{ units} = 3 \times 5 \text{ units}$$

$$52 + 2 \text{ units} = 15 \text{ units}$$

$$52 = 15 \text{ units} - 2 \text{ units} = 13 \text{ units}$$

$$1 \text{ unit} = 52 \div 13 = 4.$$

Hence the number is $5 \times 4 = 20$.

11

Sum up all the equations.

$$(\blacktriangle + \blacksquare + \blacklozenge) + (\blacksquare + \blacklozenge + \bullet) + (\blacklozenge + \bullet + \blacktriangle) + (\bullet + \blacktriangle + \blacksquare) \\ = 14 + 19 + 16 + 11 = 60$$

$$3 \times (\blacktriangle + \blacksquare + \blacklozenge + \bullet) = 60 \Rightarrow (\blacktriangle + \blacksquare + \blacklozenge + \bullet) = 20$$

So, $\blacktriangle = 20 - 19 = 1$, $\blacksquare = 20 - 16 = 4$, $\blacklozenge = 20 - 11 = 9$ and $\bullet = 20 - 14 = 6$.

The value of $\blacktriangle$ is 1.

12

The multiples of 3 are 3, 6, 9, ..., 93, 96 and 99. There are 33 such numbers. The sum of the multiples of 3 is $(3 + 99) \times 33 \div 2 = 1683$.

The multiples of 4 are 4, 8, 12, ..., 92 and 96. There are 24 such numbers. The sum of the multiples of 4 is $(4 + 96) \times 24 \div 2 = 1200$.

So, the difference between the two numbers is $1683 - 1200 = 483$.

13

Based on the diagram, the dimension of each figure (1 slab) is $1 \text{ unit} \times 2 \text{ units} \times 6 \text{ units}$. Thus, the volume of each figure is 12 units^3 . The volume of the cube is $6 \times 6 \times 6 = 216 \text{ units}^3$. Therefore, the number of figures is $216 \div 12 = \mathbf{18}$.

14

Since the difference between receiving \$11 and spending \$19 is \$30, the difference between Gina and James's dollar amounts shrinks by \$30 each week. James has \$1650 and Gina has \$1350 at the start, so the difference in their starting amounts is $1650 - 1350 = \$300$. At \$30 per week, it will take $300 \div 30 = \mathbf{10}$ weeks for them to have the same amount of money.

15

Since $\Delta + \diamond + \star + \square = 37$ and

- $\Delta + \diamond + \star = 22$, $22 + \square = 37$ so $\square = 15$
- $\square + \Delta + \diamond = 30$, $30 + \star = 37$ so $\star = 7$
- $\diamond + \star + \square = 26$, $26 + \Delta = 37$ so $\Delta = 11$

Thus, $\star + \square + \Delta = 7 + 15 + 11 = \mathbf{33}$.

Section 2 : Section B Integers - 10 Questions

16

If we add 1 to the total number of chips, then the new number N is divisible by 12 and 21. The smallest possible value of N is the least common multiple of 12 and 21 which is 84. Hence the least number of chips that Jean owns is $84 - 1 = \mathbf{83}$.

17

Since M and D have the highest place values, let them represent 8 and 9. Since I and E have the second highest place values, let them represent 6 and 7. Since N has the next highest place value, let it represent 5. Note that M and D share the same place value, therefore each letter could represent either digit (8 or 9) and would yield the same sum. The same applies to I and E. Therefore, the last three digits of the largest possible sum [sample representation: $97568 + 86579$] are **147**.

18

A diagonal cuts a rectangle into exactly two equal parts. Notice that the quadrilateral is formed by the four shaded triangles and each of the shaded triangles is exactly half of the smaller rectangles. The area of the 5×8 rectangle is 40 cm^2 and we know that the area of the smaller quadrilateral is half of the original rectangle. Half of 40 is **20** cm^2 .

19

Adam can paint $\frac{1}{6}$ of a classroom in one hour. Ben can paint $\frac{1}{12}$ of a classroom in one hour. Together, they can paint $\frac{1}{6} + \frac{1}{12} = \frac{1}{4}$ of a classroom in one hour. This means to paint the entire classroom, they need $4 \times 1 =$ **4 hours**.

20

There is only 1 way to get 23 as the sum of 3 numbers:

$$9 + 8 + 6 = 23$$

Therefore, Player Two gets 6, 8 and 9.

Afterwards, there are 1 way to get 15 as the sum of 3 numbers:

$$7 + 5 + 3 = 15$$

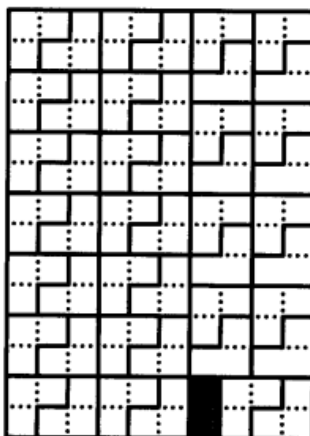
Therefore, the highest single card Player Three could have is **4**.

21

Create 2×3 blocks and pack them in as tightly as possible.

A good guess for the answer can be found by dividing the number of 1×1 squares in the large rectangle by the number of 1×1 squares in the L-tile. Notice that $140 \div 3 = 46 \text{ R } 2$, so the answer cannot be greater than 46. Can the answer be 46? Yes, if the tiles are packed as seen in the diagram. Therefore, the greatest number of these L-tiles that can fit into a 14×10 rectangle is **46**. The two shaded squares are empty.

Answer: 46



22

Let the sum of the numbers along each line be S and the numbers on the vertices (circles) of the triangle be a , b and c .

Next, let us add all the numbers along 3 lines. We can notice that the numbers 1 through 12 except a , b and c were added only once whereas a , b and c were added twice. Thus,

$$3S = (1 + 2 + 3 + \cdots + 12) + a + b + c = 78 + a + b + c$$

$$S = \frac{78 + a + b + c}{3}$$

The smallest possible value of S is obtained when $a + b + c$ is the smallest possible.

Hence S must be $\frac{78+1+2+3}{3} = \frac{84}{3} = \mathbf{28}$.

23

Two consecutive whole numbers must consist of one odd and one even integer. Hence, the sum of two consecutive integers is always an odd number. Since the square of an even number is always even and the square of an odd number is always odd, make a list of the squares of consecutive odd integers starting with 1:

$$\begin{aligned} 1^2 &= 1 = 0 + 1 \\ 3^2 &= 9 = 4 + 5 \\ 5^2 &= 25 = 12 + 13 \\ 7^2 &= 49 = 24 + 25 \\ 9^2 &= 81 = 40 + 41 \\ 11^2 &= 121 = 60 + 61 \\ 13^2 &= 169 = 84 + 85 \end{aligned}$$

Odd numbers squared greater than 13^2 result in a number greater than 200.

Therefore, there are only **7 perfect squares** less than 200 equal to the sum of two consecutive integers.

24

Since $2.5 = 2\frac{1}{2} = \frac{5}{2}$ and it takes Karen $\frac{5}{2}$ hours to paint the wall, she completes $\frac{2}{5}$ of the wall in 1 hour. Similarly, since $1.25 = 1\frac{1}{4} = \frac{5}{4}$, and it takes Stephanie $1\frac{1}{4}$ hours to paint the wall, she completes $\frac{4}{5}$ of the wall in 1 hour. Working together they complete $\frac{2}{5} + \frac{4}{5} = \frac{6}{5}$ of the wall in 1 hour. They only need to complete 1 wall, so it takes them $\frac{5}{6}$ hours or $\frac{5}{6}(60) = \mathbf{50}$ minutes.

25

Let P = cost of a pencil and let M = cost of a marker.

Then $3P + M = 2.10$ and $P + 5M = 6.30$. Adding the first equation 2 times to the second equation will get $7P + 7M = 10.50$. Hence, the total cost of 14 pencils and 14 markers is $2 \times \$10.50 = \mathbf{\$21}$.