

Time: 1½ hrs

STD: VIII

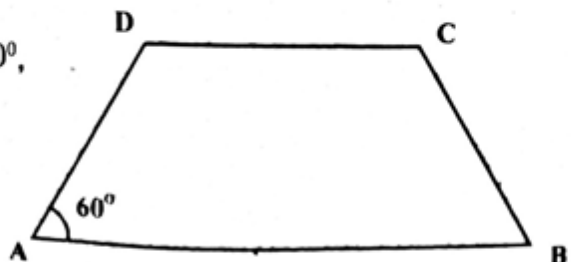
Score: 40

Instructions

- Read all instructions carefully before answering.
- Write necessary steps along with each answer.
- First 15 minutes is cool-off time.

Answer any three from questions 1 to 4. Each question carries two scores.
(3 X 2 = 6)

1. a) What number should be added to $x^2 + 6x$ to get $(x+3)^2$?
b) If $21^2 = 400 + 40 + k$, then find k .
2. If the simple interest for 100 rupees for one month is one rupee,
a) What is the interest for 100 rupees for one year?
b) What is the rate of interest?
3. Which of the following statements is not true regarding a rhombus?
i) All sides are equal.
ii) Diagonals are perpendicular bisectors of each other.
iii) One angle is 180° .
iv) Opposite angles are equal.
4. ABCD is an isosceles trapezium, if $\angle A = 60^\circ$,
a) What is the measure of $\angle B$?
b) Find measure of $\angle D$.



Answer any four from questions 5 to 10. Each question carries 3 scores.
(4 X 3 = 12)

5. Ramu deposited 1000 rupees in a bank which gives 10% simple interest. Venu deposited 1000 rupees in another bank which gives 10% interest compounded annually.

a) What amount Ramu will get back after 2 years?

b) What amount Venu will get back after 2 years?

6. a) $(x+1)(y+1) = xy + x + y + \dots$

b) Find 21×31 using the above principle.

7. Draw a square of side 4 centimetres.

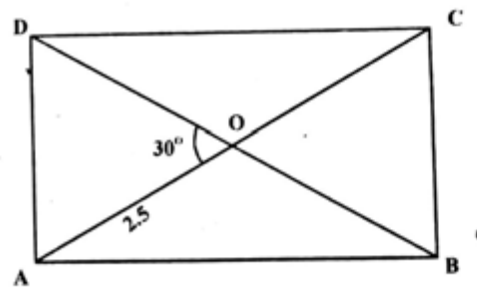
8. a) $\left(x + \frac{1}{2}\right)^2 = x^2 + 2 \times x \times \frac{1}{2} + \dots$

b) Find $\left(5\frac{1}{2}\right)^2$ using the above method

9. In rectangle ABCD, $\angle AOD = 30^\circ$,
OA = 2.5 centimetres.

a) What is the length of AC ?

b) Draw the rectangle ABCD.



10. $3 = 2^2 - 1^2$

$5 = 3^2 - 2^2$

$7 = 4^2 - 3^2$

.....

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a) Write the next line of the above pattern.

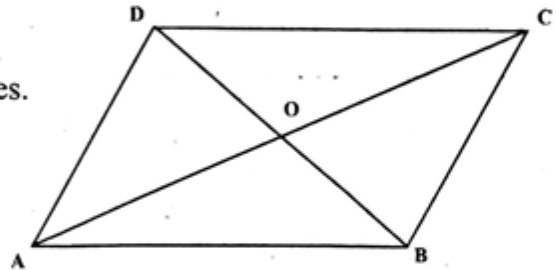
b) Write 21 as the difference of two perfect squares.

Answer any four from questions 11 to 16. Each question carries 4 scores.
(4 X 4 = 16)

11. Varun took a loan of 25000 rupees from a bank which charges 10% interest compounded annually. After one year he repaid 10000 rupees. How much should he repay to close the loan after one more year?

12. a) $4 \times 6 \times 1 = \dots\dots\dots$
 b) $7^2 - 5^2 = \dots\dots\dots$
 c) Write 32 as the difference of two perfect squares in two different ways.

13. In parallelogram ABCD, OA = 4 centimetres, OB = 3 centimetres and AB = 5.5 centimetres.



- a) What are the lengths of its diagonals?
 b) Draw the parallelogram.

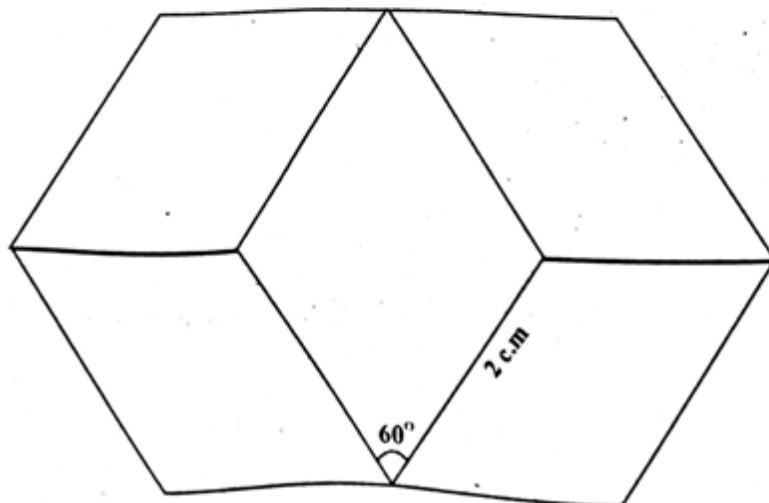
14. Firoz deposited 10000 rupees and Jeevan deposited 20000 rupees in a bank which gives interest compounded half yearly. When Firoz withdrew his deposit after 6 months, he got an amount of 10500 rupees.

- a) What is the rate of interest?
 b) What amount would Jeevan will get back after one year?

15. If x is a natural number, the next natural number is $x+1$.

- a) Write two natural numbers followed by $x+1$.
 b) Find the product of the first and fourth numbers.
 c) Find the product of the second and third numbers
 d) If a, b, c, d are four consecutive natural numbers, then find the relation between $a \times d$ and $b \times c$.

16. The figure below consists of five equal rhombuses. Draw it in the given measure.



Read the following mathematical idea and answer the questions that follow.

17. Multiples of 3 written in order gives the sequence 3, 6, 9, We know how to check whether 27 is a number of this sequence. How? $2 + 7 = 9$ and 9 is there in this sequence. So 27 will also be a number of this sequence. If we divide any natural number, which is not a multiple of 3, by 3, the possible remainders are 1 and 2. So such natural numbers can algebraically be represented as $3n-1$ or $3n-2$. Multiples of 3 can be expressed as $3n$.

$(3n)^2 = 9n^2$ is also a multiple of 3.

$(3n-1)^2 = (3n)^2 - 6n + 1 = 9n^2 - 6n + 1 = 3(3n^2 - 2n) + 1$. Remainder got on dividing this number by 3 is 1.

- a) What is the 10th number of the sequence 3, 6, 9, (1)
- b) What is the remainder on dividing $(3n)^2$ by 9 ? (1)
- c) Find the remainder on dividing $(3n-2)^2$ by 3 ? (1)
- d) What are the possible remainders on dividing any natural number by 3? (1)
- e) Check whether 2018 is a multiple of 3. (1)
- f) What number added to $(3n-1)^2$ gives a multiple of 3? (1)