Pabna Cadet College

Term End Examination - 2020

Subject: Mathematics

Class: VII

Time: 20 minutes   Full Marks: 20

Answer all the questions

1. In which way can the square root of a be expressed?

   i. $a \times a$ ii. $\sqrt[3]{a}$ iii. $a2$ iv. $a^{\frac{1}{2}}$

2. Which one is a rational number?

   i. 1.666... ii. $\sqrt{3}$ iii. $\sqrt{7}$ iv. 2.343

3. 16:A::A:64. A = ?

   i. 32 ii. 24 iii. 27 iv. 42

4. A book is bought at 40 tk. and sold at 50 tk. What is the percentage of profit?

   i. 20 ii. 25 iii. 22 iv. 15

5. Speed of a boat against current is y km/hour. If the speed of the boat is x km/hour in still water, what is the speed of current (in km/hour)?

   i. y - x ii. x iii. x + y iv. x - y

6. 100 sq. decimeter = how many sq.meters?

   i. 0.01 ii. 1 iii. 0.10 iv. 10

7. Area and length of a triangle are 5 sq. units and 4 units, respectively. What is the height of the triangle?

   i. 2.5 ii. 5 iii. 2 iv. 3

8. A car burns 10 liters of diesel to run 80 km. How much diesel does it require to run 1 km?

   i. 28 ii. 80 iii. 125 iv. 150

9. $a^2 + b^2 =$?

   i. $(a+b)^2 - 2ab$ ii. $a^2 - 2ab + b^2$ iii. $a^2 + 2ab + b^2$ iv. $(a-b)^2 - 2ab$

10. If $a^2 + \frac{1}{a^2} = 3$, what is the value of $(a - \frac{1}{a})^2$?

    i. 0 ii. 1 iii. 2 iv. 3

11. $(a - \frac{1}{2}b)(a - \frac{1}{3}b) =$?

    i. $\frac{1}{6}(6a^2 + 5ab + b^2)$ ii. $\frac{1}{6}(6a^2 - 5ab - b^2)$ iii. $\frac{1}{6}(6a^2 - 5ab + b^2)$ iv. $\frac{1}{6}(a^2 - 5ab + b^2)$

12. $a^2 - 36$ and $a^2 + a - 30$ are two expressions. Which of the following is their common factor?

    i. m + 6 ii. m - 6 iii. m + 5 iv. m - 5

13. HCF of xyz, 7x, and 4xp is —

    i. xp ii. x iii. 28xyzp iv. xyz

14. $x^2 - 4 = 0$ is an equation.

    a. There is only one variable in the equation.
    b. The equation has more than one root.

c. The equation has a negative root.

Which of the above are correct?

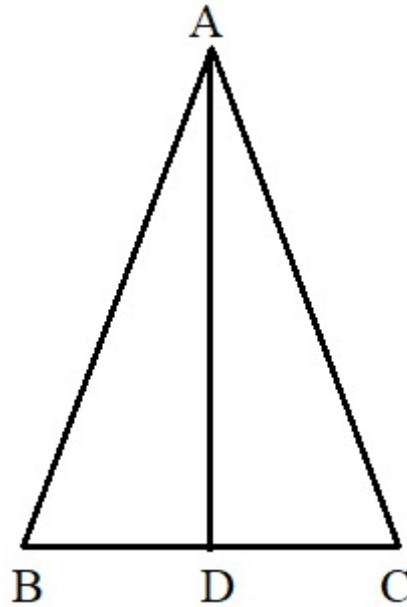   i. a & b ii. b & c iii. a & c iv. a, b, & c

15. What is the number, if 20 subtracted from it, the difference would be -15?

    i. 10 ii. 5 iii. 20 iv. -5

16. If a line intersects two lines, how many pairs of corresponding angles can be made?

    i. 5 ii. 4 iii. 2 iv. 3

17. In the figure, AD is the bisector of $\angle ABC, AB = AC$

$\angle ABD =$?

    i. $\angle ADB$ ii. $\angle ADC$ iii. $\angle BAD$ iv. $\angle ACB$

18. If sides of two similar triangles are equal to each other, the triangles are -

    i. similar ii. congruent iii. symmetrical iv. asymmetrical

Answer the question 19 - 20 as per the following data

Marks of some students are given below.

Interval	11-15	16-20	21-25	26-30	31-35
Frequency	5	6	3	4	5

19. What is the interval of each class?

    i. 4 ii. 5 iii. 6 iv. not equal for all classes

20. What is the percentage of students getting marks above 25?

    i. 39% ii. 22% iii. 40% iv. Cannot be determined from the given data

Answers

| Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer	iv	iv	i	ii	iv	ii	i	iii	i	i	iii	i	ii	iv	ii	ii	iv	ii	ii	i

Creative Questions

1. Three friends Saleh, Tahmid, and Rasel collect 10710 tk. for a program. Rasel gives half of Saleh's amount, while Tahmid gives $\frac{5}{3}$ part of Rasel.

a. Determine the simple ratio of their amount.
b. How many tk. did Rasel and Tahmid contribute?
c. If 10,010 tk. is spent for the program, how much amount would each of them get back?

Solution

a. Ratio: $Saleh : Tahmid : Rasel = 1 : \frac{5}{6} : \frac{1}{2}$

   Simple Ratio: $3 : 5 : 6$ (multiplying by 6)

b. $3 + 5 + 6 = 14$

   Rasel's amount $= 2295$

   Tahmid's amount $= 3825$

   Saleh's amount $= 4590$

c. Remaining amount $= 700$

   Rasel would get back $= 150$

   Tahmid would get back $= 250$

   Saleh would get back $= 300$

2. *The breadth of a rectangular space is one-forth its length.*

a. If the length is x, express the perimeter of the space in terms of x.
b. If the perimeter of the garden is 40 meter, what are the length and breadth of the garden?
c. If the total cost of cleaning the garden is 1500 tk, what will be the cost to clean per square meter of the garden?

Solution

a. Let, length is x

   $\therefore$ breadth $= \frac{x}{4}$

   $\therefore$ perimeter $= 2(x + \frac{x}{4}) = \frac{10x}{4}$

b. $\frac{10x}{4} = 40$

   $\therefore length, x = 16$ and width $= \frac{16}{4} = 4$

c. Total Area $= 16 \times 4 = 64$

   Cost per square meter $= \frac{1500}{64} = 23.4375$

3. Observe the figure
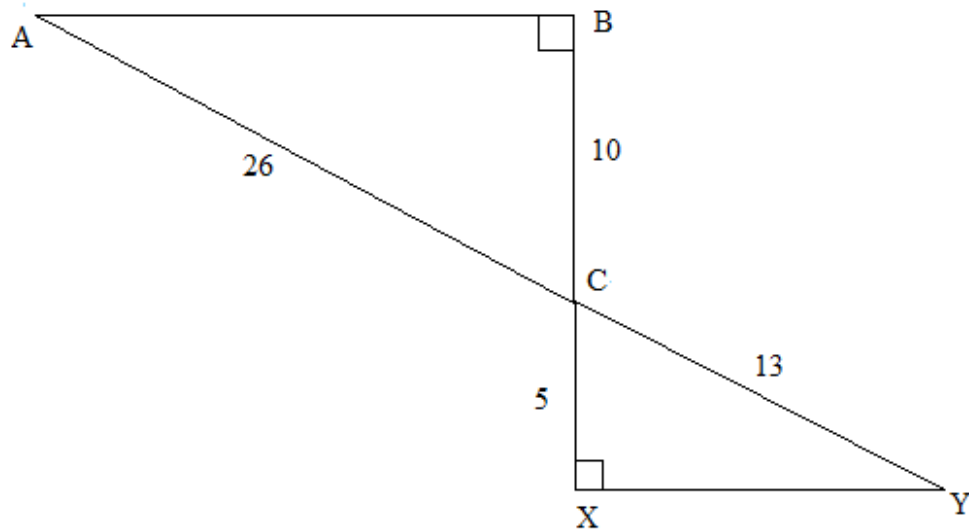
a. Show the matching angles.
b. Determine the ratio of the matching sides.
c. Show that $\triangle ABC$ and $\triangle CXY$ are similar.

Solution

a. Matching angles of $\angle ABC$, $\angle ACB$, and $\angle BAC$ are $\angle CXY$, $\angle XCY$, and $\angle CYX$.

b. CX:BC $= 5:10 = 1:2$

CY:AC $= 13:26 = 1:2$

c. In the $\triangle ABC$ and $\triangle CXY$,

$\angle ABC = \angle CYX = 90^o$ (one right angle)

Again, from (b), CX:BC $= 1:2 =$ CY:AC

$\therefore \triangle ABC$ and $\triangle CXY$ are similar.

—Good Luck—