Mathematics

REVISION and MODEL QUESTIONS

Four alternatives are given for each of the following questions/incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its alphabet in the space provided against each questions.

1) The discriminant of the quadratic equation $ax^2+bx+c=0$ is

a) b^2-4ac b) c^2-4ab
c) b^2+4ac d) a^2+4ab

Ans:- (a) b^2-4ac

2) Zeroes of a polynomial can be expressed graphically. Number of zeroes of polynomial is equal to number of points where the graph of polynomial is:

(a) Intersects x-axis
(b) Intersects y-axis
(c) Intersects y-axis or x-axis
(d) None of the above

Ans: (a) Intersects x-axis

3) The sum of the reciprocals of Rehman's ages 3 years ago and 5 years from now is 1/3. The present age of Rehman is:

(a) 7 (b) 10
(c) 5 (d) 6

Ans: (a) 7

Expln: Let, x is the present age of Rehman
Three years ago his age = x – 3
Five years later his age = x + 5
Given, the sum of the reciprocals of Rehman's ages 3 years ago and after 5 years is equal to 1/3.
$\therefore$ 1/x-3 + 1/x-5 = 1/3
(x+5+x-3)/(x-3)(x+5) = 1/3
(2x+2)/(x-3)(x+5) = 1/3
$\Rightarrow$ 3(2x + 2) = (x-3)(x+5)
$\Rightarrow$ 6x + 6 = x^2 + 2x – 15
$\Rightarrow$ x^2 – 4x – 21 = 0
$\Rightarrow$ x^2 – 7x + 3x – 21 = 0
$\Rightarrow$ x(x – 7) + 3(x – 7) = 0
$\Rightarrow$ (x – 7)(x + 3) = 0
$\Rightarrow$ x = 7, -3
We know age cannot be negative, hence the answer is 7.

4) Which term of the A.P. 3, 8, 13, 18, … is 78?

(a) 12^{th} (b) 13th
(c) 15^{th} (d) 16th

Ans: **(d) 16th**

Expln: Given, 3, 8, 13, 18, … is the AP.
First term, a = 3
Common difference, d = $a_2 - a_1$ = 8 − 3 = 5
Let the nth term of given A.P. be 78.
Now as we know,
a_n = a+(n−1)d
Therefore,
78 = 3+(n −1)5
75 = (n−1)5
(n−1) = 15
n = 16

5) If triangles ABC and DEF are similar and AB=4 cm, DE=6 cm, EF=9 cm and FD=12 cm, the perimeter of triangle ABC is:

(a) 22 cm (b) 20 cm
(c) 21 cm (d) 18 cm

Ans: (d) 18 cm

Expln: ABC ~ DEF
AB=4 cm, DE=6 cm, EF=9 cm and FD=12 cm
AB/DE = BC/EF = AC/DF
4/6 = BC/9 = AC/12
BC = (4.9)/6 = 6 cm
AC = (12.4)/6 = 8 cm
Perimeter of triangle ABC = AB+BC+AC
= 4+6+8
=18 cm

6) The point which divides the line segment of points P(-1, 7) and (4, -3) in the ratio of 2:3 is:

(a) (-1, 3) (b) (-1, -3)
(c) (1, -3) (d) (1, 3)

Ans: (d) (1, 3)

Expln: By section formula we know:
x = [(2 × 4) + (3 × (-1))]/(2 + 3) = (8 – 3)/5 = 1
y = [(2 × (-3)) + (3 × 7)]/(2 + 3) = (-6 + 21)/5 = 3
Hence, the required point is (1, 3).

7) If cos X = a/b, then sin X is equal to:

(a) $(b^2-a^2)/b$ (b) (b-a)/b
(c) $\sqrt{(b^2-a^2)}/b$ (d) $\sqrt{(b-a)}/b$

Ans: **(c) $\sqrt{(b^2-a^2)}/b$**

Expln: cos X = a/b
By trigonometry identities, we know that:
$\sin^2X + \cos^2X = 1$
$\sin^2X = 1 - \cos^2X = 1-(a/b)^2$
$\sin X = \sqrt{(b^2-a^2)}/b$

8) If a parallelogram circumscribes a circle, then it is a:

(a) Square
(b) Rectangle
(c) Rhombus
(d) None of the above

Ans: (c) Rhombus

Expln :- If a parallelogram circumscribes a circle, then it is a Rhombus.

9) Find the LCM of the following integers by applying the prime factorization method.
17, 23 and 29

(Contd….)