

SAHIWAL BOARD
GRADE 10
MATH
2019 GROUP 1

Section-A (MCQs)

i) Standard form of a quadratic equation is: (Mark 1)

- A. $bx + c = 0, b \neq 0$
- B. $ax^2 + bx + c = 0, a \neq 0$
- C. $ax^2 = bx, a \neq 0$
- D. $ax^2 = 0, a \neq 0$

Answer:

- B. $ax^2 + bx + c = 0, a \neq 0$

ii) Product of cube roots of unity is (Mark 1)

- A. 0
- B. 1
- C. -1
- D. 3

Answer:

- B. 1

iii) If $b^2 - 4ac < 0$, then roots of are (Mark 1)

- A. Irrational
- B. Rational
- C. Imaginary
- D. Equal

Answer:

- C. Imaginary

iv) If $y^2 \propto 1/x^3$ then (Mark 1)

- A. $y^2 = k/x^3$
- B. $y^2 = 1/x^3$
- C. $y^2 = x^2$
- D. $y^2 = kx^3$

Answer:

- A. $y^2 = k/x^3$

v) If $\frac{a}{b} = \frac{c}{d}$, then componendo property is

(Marks 1)

A. $\frac{a}{a+b} = \frac{c}{c+d}$

B. $\frac{a}{a-b} = \frac{c}{c-d}$

C. $\frac{ad}{bc}$

D. $\frac{a-b}{b} = \frac{c-d}{d}$

Answer:

A

vi) A fraction in which the degree of the numerator is greater or equal to the degree of the denominator is called a/an (Mark 1)

- A. Proper fraction
- B. Improper fraction
- C. Equation
- D. Identify

Answer:

B. Improper fraction

vii) A set $Q = \{a/b \mid a, b \in \mathbb{Z} \ \& \ b \neq 0\}$ is called a set of (Mark 1)

- A. Whole numbers
- B. Natural numbers
- C. Irrational numbers
- D. Rational numbers

Answer:

D. Rational numbers

viii) The number of elements on power set $\{1,2,3\}$ is (Mark 1)

- A. 4
- B. 6
- C. 8
- D. 9

Answer:

C. 8

ix) The extent of variation between two extreme observations of a data set is measured by (Mark 1)

- A. Average
- B. Range
- C. Quartiles

D. Dispersion

Answer:

B. Range

x) $3\pi/4$ radian =

(Mark 1)

A. 115°

B. 135°

C. 150°

D. 30°

Answer:

B. 135°

xi) $\operatorname{cosec}^2\theta - \cot^2\theta =$

(Mark 1)

A. -1

B. 1

C. 0

D. $\tan\theta$

Answer:

B. 1

xii) Locus of a point in a plane equidistant from a fixed point is called:

(Mark 1)

A. radius

B. circle

C. circumference

D. diameter

Answer:

B. circle

xiii) A tangent line intersects the circle at no point at all

(Mark 1)

A. three points

B. two points

C. single points

D. no point at all

Answer:

C. single points

xiv) The length of a chord and the radial segment of a circle are congruent. The central angle made by the chord will be

(Mark 1)

A. 30°

B. 45°

C. 60°

D. 75°

Answer:

C. 60°

xv) The measure of the external angle of a regular hexagon is: (Mark 1)

A. $\pi/3$

B. $\pi/4$

C. $\pi/6$

D. $\pi/2$

Answer:

A. $\pi/3$

Q.2 i) Define quadratic equation. (Marks 2)

Q.2 ii) Solve by factorization $x^2 - x - 20 = 0$ (Mark 2)

Q.2 iii) Discuss the nature of the roots of the quadratic equation. $x^2 + 3x + 5 = 0$ (Marks 2)

Q.2 iv) Evaluate $(1 - \omega + \omega^2)^6$ (Marks 2)

Q.2 v) Find $1/\alpha_2 + 1/\beta_2$ of the roots of equation $x^2 - 4x + 3 = 0$ (Marks 2)

Q.2 vi) Prove that the sum of all the cube roots of unity is zero. (Marks 2)

Q.2 vii) Define direct variation. (Marks 2)

Q.2 viii) Find a mean proportional to 16 and 49 (Marks 2)

Q.2 ix) Find x if $6:x :: 3:5$ (Marks 2)

Q.3 i) Resolve into partial fractions $\frac{(3x-1)}{(x^2-1)}$ (Marks 2)

Q.3 ii) If $X = \{1,4,7,9\}$ and $Y = \{2,4,5,9\}$ the find $Y \cup X$. (Marks 2)

Q.3 iii) If $(2a + 5, 3) = (7, b - 4)$ then find a and b. (Marks 2)

Q.3 iv) If $Y = \{-2,1,2\}$ then find two binary binary relation for $Y \times Y$ (Marks 2)

Q.3 v) Define one-one function. (Marks 2)

Q.3 vi) The salaries of five teachers are as follows. find mean 11500, 12400, 15000, 14500, 14800 (Marks 2)

Q.3 vii) Find the modal size (mode) of shoe for the given data 4,4,5,6,6,6,7,7,5,8,8,8,6,5,6,7,5 (Marks 2)

Q.3 viii) Define harmonic mean. (Marks 2)

Q.3 ix) Define mode. (Marks 2)

Q.4 i) Find θ when $l = 4.5$ m, $r = 2.5$ m (Marks 2)

Q.4 ii) Prove that $\frac{1}{1 - \cos\theta} + \frac{1}{1 + \cos\theta} = 2\operatorname{cosec}^2\theta$ (Marks 2)

Q.4 iii) Define acute angle. (Marks 2)

Q.4 iv) Define the sector of a circle. (Marks 2)

Q.4 v) Define tangent of a circle. (Marks 2)

Q.4 vi) Differentiate between a chord and the diameter of a circle. (Marks 2)

Q.4 vii) Define circum-angle. (Marks 2)

Q.4 viii) Define vertices. (Marks 2)

Q.4 ix) Define triangle. (Marks 2)

Q.5 a) Solve by using quadratic formula $\frac{x+2}{x-1} - \frac{4-x}{2x} = 2\frac{1}{3}$ (Marks 4)

Q.5 b) Solve the given equation by using synthetic division having roots -2 and 6. $x^4 - 49x^2 + 36x + 252 = 0$ (Marks 3)

Q.6 a) Solve by using the theorem of componendo - dividendo.

$$\frac{\sqrt{x^2+2} + \sqrt{x^2-2}}{\sqrt{x^2+2} - \sqrt{x^2-2}} = 2$$

(Marks 4)

Q.9 a) Prove that: Perpendicular from the center of a circle on a chord bisects it. (Marks 5)

Q.6 b) Resolve into partial fractions $\frac{7x-25}{(x-4)(x-3)}$ (Marks 4)

Q.7 a) If $U = \{1,2,3,4,\dots,10\}$, $A = \{1,3,5,7,9\}$ and $B = \{1,4,7,10\}$ then verify that $(A \cap B)' = A' \cup B'$ (Marks 5)

Q.7 b) The length of 32 items are given below. Find the mean length of the distribution.

(Marks 4)

Q.8 a) If $\cos\theta = -2/3$ and terminal arm of the angle θ is in quadrant II, find the values of remaining trigonometric functions. (Marks 5)

Q.8 b) Draw two perpendicular tangents to a circle of radius 3cm. (Marks 3)

Q.9 b) Prove that: the measure of a central angle of a minor arc of a circle, is double that of the angle subtended by the corresponding major arc. (Marks 3)

SAHIWAL BOARD

GRADE 10

MATH

2019 GROUP 2

Section-A (MCQs)

i) The quadratic formula is

(Mark 1)

A. $x = \frac{-b \pm \sqrt{b^2 + 4ac}}{2a}$

B. $x = \frac{b \pm \sqrt{b^2 - 4ac}}{2a}$

C. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

D. $x = \frac{b \pm \sqrt{b^2 + 4ac}}{2a}$

Answer:

C

ii) Sum of the cube roots of unity is

(Mark 1)

A. 0

B. 1

C. -1

D. 3

Answer:

A. 0

iii) If α, β are the roots of $3x^2 + 5x - 2 = 0$, then $\alpha + \beta =$ ____.

(Mark 1)

A. $-5/3$

B. $5/3$

C. $3/5$

D. $-2/3$

Answer:

A. $-5/3$

iv) If $u/v = v/w = k$ then

(Mark 1)

A. $u = vk^2$

B. $u = w^2k$

C. $u = v^2k$

D. $u = wk^2$

Answer:

D. $u = wk^2$

v) The fourth proportional w of $x:y :: v:w$ is

(Mark 1)

A. xy/v

B. x/yv

C. yv/x

D. xyv

Answer:

C. yv/x

vi) $\frac{2x+1}{(x+1)(x-1)}$ is a/an

(Mark 1)

- A. Equation
- B. Identity
- C. Proper fraction
- D. Improper fraction

Answer:

C

vii) A set with no element is called.

(Mark 1)

- A. Subset
- B. Singleton set
- C. Superset
- D. Empty set

Answer:

D. Empty set

viii) The range of $R = \{(1,3),(2,2),(3,1),(4,4)\}$ is

(Mark 1)

- A. {1,2,3,4}
- B. {1,3,4}
- C. {3,2,4}
- D. {1,2,3}

Answer:

A. {1,2,3,4}

ix) Mean is affected by a change in

(Mark 1)

- A. value
- B. ratio
- C. origin
- D. place

Answer:

C. origin

x) $\frac{1}{2} \operatorname{cosec} 45^\circ =$

(Mark 1)

A. $\frac{\sqrt{3}}{2}$

B. $\frac{1}{\sqrt{2}}$

C. $\sqrt{2}$

D. $\frac{1}{2\sqrt{2}}$

Answer

C.

xi) $\frac{1}{1 + \sin\theta} + \frac{1}{1 - \sin\theta} =$

(Mark 1)

A. $2\sec^2\theta$

B. $2\cos^2\theta$

C. $\sec^2\theta$

D. $\cos\theta$

Answer:

A

xii) The symbol used for a triangle is

(Mark 1)

A. <

B. Δ

C. \perp

D. \odot

Answer:

B. Δ

xiii) Two tangents drawn to a circle from a point outside it are of _____ in length. (Mark 1)

A. Half

B. Equal

C. Double

D. Tripple

Answer:

B. Equal

xiv) A pair of chords of a circle subtended two congruent central angles

is (Mark 1)

- A. Congruent
- B. Incongruent
- C. Overlapping
- D. Parallel

Answer:

- A. Congruent

xv) A line intersecting a circle is called:

(Mark 1)

- A. Tangent
- B. Chord
- C. Diameter
- D. Secant

Answer:

- D. Secant

Q.2 i) Solve by factorization. $x^2 - 11x = 152$ (Marks 2)

Q.2 ii) Solve by using quadratic formula. $6x^2 - 3 - 7x = 0$ (Mark 2)

Q.2 iii) If α, β are the roots of the equation $lx^2 + mx + n = 0$ ($l \neq 0$) then find the value of $1/\alpha^2 + 1/\beta^2$. (Marks 2)

Q.2 iv) Evaluate $\omega^{37} + \omega^{38} - 5$ (Marks 2)

Q.2 v) Find the discriminant of $6x^2 - 8x + 3 = 0$. (Marks 2)

Q.2 vi) If α, β of the roots of equation $x^2 - 3x + 6 = 0$. Form equation whose roots are α^2, β^2 . (Marks 2)

Q.2 vii) Define inverse variation. (Marks 2)

Q.2 viii) Find a third proportional to $a^2 - b^2, a - b$ (Marks 2)

Q.2 ix) If u and v varies inversely and $u=8$ when $v=3$. Find v when $u = 12$. (Marks 2)

Q.3 i) Define proper fraction with example. (Marks 2)

Q.3 ii) If $X = \{1,4,7,9\}$ and $Y = \{2,4,5,9\}$ the find $X \cup Y$ and $X \cap Y$. (Marks 2)

Q.3 iii) Define set with an example. (Marks 2)

Q.3 iv) Find a and b if $(a - 4, b - 2) = (2, 1)$ (Marks 2)

Q.3 v) Write all the subsets of the set $\{a,b\}$ (Marks 2)

Q.3 vi) Define arithmetic mean. (Marks 2)

Q.3 vii) Find range from the given data 11500, 12400, 15000, 14500, 14800 (Marks 2)

Q.3 viii) Find arithmetic mean. 12,14,17,20,24,29,35,45 (Marks 2)

Q.3 ix) Define mode. (Marks 2)

Q.4 i) Convert $7\pi/8$ into degree. (Marks 2)

Q.4 ii) Verify the identity $\tan\theta + \cot\theta = \sec\theta \operatorname{cosec}\theta$ (Marks 2)

Q.4 iii) Define acute angle. (Marks 2)

Q.4 iv) Define the sector of a circle. (Marks 2)

Q.4 v) Define chord of a circle. (Marks 2)

Q.4 vi) Define the arc of a circle. (Marks 2)

Q.4 vii) Define diameter of circle. (Marks 2)

Q.4 viii) Define inscribed circle. (Marks 2)

Q.4 ix) Define polygon. (Marks 2)

Q.5 a) Solve the given equation by completing square.

$$11x^2 - 34x + 3 = 0 \quad (\text{Marks 4})$$

Q.5 b) If α, β are the roots of the equation $x^2 + px + q = 0$ form equation whose roots are $\alpha/\beta, \beta/\alpha$ (Marks 4)

Q.6 a) Solve the equation by using componendo dividendo theorem

$$\frac{(x+5)^3 - (x-3)^3}{(x+5)^3 + (x-3)^3} = \frac{13}{14} \quad (\text{Marks 4})$$

Q.6 b) Resolve into partial fractions $\frac{1}{(x-1)^2(x+1)}$ (Marks 4)

Q.7 a) If $A = \{1,2,3,4,5,6\}$, $B = \{2,4,6,8\}$ and $C = \{1,4,8\}$ then verify that $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ (Marks 4)

Q.7 b) Calculate variance of the data 10,8,9,7,5,12,8,6,8,2 (Marks 4)

Q.8 a) Find the angle of elevation of the sun if a 6 feet man casts a 3.5 feet shadow. (Marks 4)

Q.8 b) For an arc draw two perpendicular bisectors of the chords PQ and QR of this arc, construct a circle through P, Q, and R. (Marks 4)

Q.9 a) Prove that: Perpendicular from the center of a circle on a chord bisects it. (Marks 8)

Q.9 b) Prove that: the opposite angles of any quadrilateral inscribed in a circle are supplementary. (Marks 8)