

FAISALABAD BOARD

GRADE 10

MATHEMATICS

2019 GROUP 1

Lesson 1 of 38

Section-A (MCQs)

i) The power set of an empty set is: (Mark 1)

- A. ϕ
- B. $\{a\}$
- C. $\{\phi, \{a\}\}$
- D. $\{\phi\}$

Answer:

- D. $\{\phi\}$

ii) A collection of well-defined objects is called: (Mark 1)

- A. Subset
- B. Power set
- C. Set
- D. Superset

Answer:

- C. Set

iii) A fraction in which the degree of numerator is less than the degree of the denominator is called: (Mark 1)

- A. An equation
- B. An improper fraction
- C. An Identity
- D. A proper fraction

Answer:

- D. A proper fraction

iv) The fourth proportional w of x: y : : v : w is: (Mark 1)

- A. xy/v
- B. vy/x
- C. xyv

D. x/vy

Answer:

B. vy/x

v) In continued proportion $a:b=b:c$, $ac=b^2$, b is said to be _____ proportional between a and c . (Mark 1)

A. Third

B. Fourth

C. Mean

D. Extremes

Answer:

C. Mean

vi) $a^2+\beta^2=_____$. (Mark 1)

A. $a^2-\beta^2$

B. $1/a^2+1/\beta^2$

C. $(a+\beta)^2-2a\beta$

D. $a+\beta$

Answer:

C. $(a+\beta)^2-2a\beta$

vii) Roots of the equation $4x^2-5x+2=0$ are: (Mark 1)

A. Irrational

B. Imaginary

C. Rational

D. Equal

Answer:

B. Imaginary

viii) The Solution set of the equation $x^2-9=0$:_____ (Mark 1)

A. {9}

B. {3}

C. { ± 3 }

D. {9,3}

Answer:

C. { ± 3 }

ix) The length of the diameter of a circle is how many times the radius of the circle. (Mark 1)

A. 1

B. 2

C. 3

D. 4

Answer:

B. 2

x) Out of two congruent arcs of a circle if one arc makes a central angle of 30° then the other arc will subtend the central angle of

_____.

(Mark

1)

A. 15°

B. 30°

C. 45°

D. 60°

Answer:

B. 30°

xi) A circle has only one:_____.

(Mark 1)

A. Secant

B. Chord

C. Diameter

D. Center

Answer:

D. Center

xii) The distance of any point of the circle to its center is called:_____.

(Mark

1)

A. Radius

B. Diameter

C. A chord

D. An arc

Answer:

A. Radius

A. $2\sec^2\theta$

B. $2\cos^2\theta$

C. $\sec^2\theta$

D. $\cos\theta$

Answer:

A. $2\sec^2\theta$

xiv) The union of two non-collinear rays, which have a common endpoint is called:_____.

(Mark 1)

- A. An angle
- B. A degree
- C. A minute
- D. A radian

Answer:

- A. An angle

xv) The measure which determines the middlemost observation in a data set is called:_____ . (Mark 1)

- A. Median
- B. Mode
- C. Mean
- D. Harmonic Mean

Answer:

- A. Median

Q.2 i) Write in standard form $\frac{x}{x+1} + \frac{x+1}{x} = 6$ (Marks 2)

Q.2 ii) Solve by factorization $5x^2=15$. (Marks 2)

Q.2 iii) Write quadratic equation having roots 4,9. (Marks 2)

Q.2 iv) Find ω^2 , if $\omega = \frac{-1+\sqrt{-3}}{2}$. (Marks 2)

Q.2 v) Define Simultaneous equations. (Marks 2)

Q.2 vi) Evaluate $(9+4\omega+4\omega^2)^3$. (Marks 2)

Q.2 vii) Define ratio and give one example. (Marks 2)

Q.2 viii) Find the value of x when $6 : x :: 3 : 5$. (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) Resolve $\frac{1}{x^2-1}$ into partial fractions. (Marks 2)

Q.3 ii) Define an onto function. (Marks 2)

Q.3 iii) Write De-Morgan's Law. (Marks 2)

Q.3 iv) If $U=\{1, 2, 3, \dots, 10\}$ and $A=\{2, 4, 6, 8\}$ then find A' . (Marks 2)

Q.3 v) If $A=\{a, b\}$ and $B=\{c, d\}$, then find $B \times A$ and $B \times B$. (Marks 2)

Q.3 vi) Write any two properties of arithmetic mean. (Marks 2)

Q.3 vii) Define standard deviation. (Marks 2)

Q.3 viii) Find the geometric mean of the observations 2, 4, 8 using basic formula. (Marks 2)

Q.3 ix) What do you mean by weighted arithmetic mean. (Marks 2)

Q.4 i) Express angle 225° into radians. (Marks 2)

Q.4 ii) Prove that $\frac{\sin\theta + \cos\theta}{\cos\theta} = 1 + \tan\theta$ (Marks 2)

Q.4 iii) Define projection of a point. (Marks 2)

Q.4 iv) Define a circle. (Marks 2)

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

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

Q.4 vii) Define central angle. (Marks 2)

Q.4 viii) Define regular polygon. (Marks 2)

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

Q.5 a) Solve the given equation $\sqrt{x+3} = 3x - 1$ (Marks 4)

Q.5 b) Prove that $x^3 + y^3 = (x+y)(x+\omega y)(x+\omega^2 y)$. (Marks 4)

Q.6 a) Using theorem of componendo dividendo, solve the

equation: $\frac{\sqrt{x+3} + \sqrt{x-3}}{\sqrt{x+3} - \sqrt{x-3}} = \frac{4}{3}$. (Marks 4)

Q.6 b) Resolve $\frac{11x+3}{(x-3)(x^2+9)}$ into partial fractions. (Marks 4)

Q.7 a) If $A=\{1, 3, 5, 7, 9\}$, $B=\{1, 4, 7, 10\}$, $C=\{1, 5, 8, 10\}$ then verify that $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ (Marks 4)

Q.7 b) Calculate standard deviation for the data: 12, 6, 7, 3, 15, 10, 18, 5 (Marks 4)

Q.8 a) If $\cos \theta = \frac{-2}{3}$ and terminal arm of the angle θ is in quadrant II, find the values of remaining trigonometric functions. (Marks 4)

Q.8 b) Practically find the center of an arc ABC. (Marks 4)

Q.8 b) Practically find the center of an arc ABC. (Marks 4)

FAISALABAD BOARD

GRADE 10

MATHEMATICS

2019 GROUP 2

Lesson 1 of 38

Section-A (MCQs)

i) How many common tangents can be drawn for two disjoint circles? (Mark 1)

- A. 2
- B. 3
- C. 1
- D. 4

Answer:

D. 4

ii) A pair of chords of a circle subtending two congruent central angles is: (Mark 1)

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

Answer:

A. Congruent

iii) Tangents drawn at the ends of diameter of a circle are _____ to each other.

(Mark 1)

A. Parallel

B. Non-parallel

C. Collinear

D. Perpendicular

Answer:

A. Parallel

iv) Line segment joining any point of the circle to the center is called:

(Mark 1)

A. Circumference

B. Diameter

C. Radial segment

D. Perimeter

Answer:

C. Radial segment

v) $\sec^2\theta =$

(Mark 1)

A. $1 - \sin^2\theta$

B. $1 + \tan^2\theta$

C. $1 - \cos^2\theta$

D. $1 - \tan^2\theta$

Answer:

B. $1 + \tan^2\theta$

vi) $20^\circ =:$

(Mark 1)

A. $360'$

B. $630'$

C. $3600'$

D. $1200'$

Answer:

D. $1200'$

vii) Sum of the deviations of variable 'X' from its mean is always:

(Mark

1)

A. 0

B. 1

C. Same

D. 2

Answer:

A. 0

viii) If $A \subseteq B$ then $A - B$ is equal to:

(Mark 1)

A. A

B. B

C. \emptyset

D. $B - A$

Answer:

C. \emptyset

ix) The set $\{x/xW^x \leq 101\}$ is:

(Mark 1)

A. Infinite set

B. Subset

C. Null set

D. Finite set

Answer:

D. Finite set

x) $2x+1/(x+1)(x-1)$ is:

(Mark 1)

A. An improper fraction

B. An equation

C. A proper fraction

D. An identity

Answer:

C. A proper fraction

xi) If $a:b = x:y$ then alternendo property is:

(Mark 1)

A. $a/x = b/y$

B. $a/b = x/y$

C. $a+b/b = x+y/y$

D. $a-b/b = x-y/y$

Answer:

A. $a/x = b/y$

xii) If $u \propto v^2$ then:

(Mark 1)

A. $u=v^2$

B. $u=kv^2$

C. $uv^2=k$

D. $uv^2=1$

Answer:

B. $u=kv^2$

xiii) If α, β are the roots of $px^2+qx+r=0$, then sum of roots 2α and 2β is:

(Mark 1)

- A. $-q/p$
 - B. $-2q/p$
 - C. r/p
 - D. $-q/2p$
- Answer:
B. $-2q/p$

xiv) Two square roots of unity are:

(Mark 1)

- A. $1, \omega$
 - B. $1, -1$
 - C. $1, -\omega$
 - D. ω, ω^2
- Answer:
B. $1, -1$

xv) The number of terms in a standard quadratic equation $ax^2+bx+c=0$ is:

(Mark 1)

- A. 1
 - B. 2
 - C. 3
 - D. 4
- Answer:
C. 3

Q.2 i) Solve by factorization: $x^2-x-20=0$

(Marks 2)

Q.2 ii) Define reciprocal equation.

(Marks 2)

Q.2 iii) Without solving the equation $2px^2+3qx-4r=0$, find the sum and product of its roots.

(Marks 2)

Q.2 iii) Without solving the equation $2px^2+3qx-4r=0$, find the sum and product of its roots.

(Marks 2)

Q.2 v) Write the quadratic equations having the roots $-1, -7$

(Marks 2)

Q.2 vi)

(Marks 2)

If α, β are the roots of equation $4x^2 - 5x + 6 = 0$, then find the values of $\alpha^2\beta^2$

Q.2 vii) Define inverse variation.

(Marks 2)

Q.2 viii) Find the fourth proportional to 8,7,6. (Marks 2)

Q.2 ix) Find x in the given proportion: $3x-2:4::2x+3:7$ (Marks 2)

Q.3 i) Find partial fractions of $\frac{3}{(x+1)(x-1)}$ (Marks 2)

Q.3 ii) Find the sets X and Y if $X \times Y = \{(a,a), (b,a), (c,a), (d,a)\}$ (Marks 2)

Q.3 iii) If $A = \{1,2,3,4,5,6\}, B = \{2,4,6,8\}$ then prove that $A \cap B = B \cap A$

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

Q.3 v) Define a function. (Marks 2)

Q.3 vi) Name two measures of central tendency. (Marks 2)

Q.3 vii) Find harmonic mean for the given data:

(Marks 2)

x	12	5	8	8
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Q.3 viii) On 5 terms tests in mathematics, a student has made marks of 82, 93, 86, 92 and 79. Find the median for the marks. (Marks 2)

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

Q.4 i) Prove that: $\tan^4\theta + \tan^2\theta = \tan^2\theta \sec^2\theta$ (Marks 2)

Q.4 ii) What are trigonometric ratios? (Marks 2)

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

Q.4 iv) Define Circumcircle. (Marks 2)

Q.4 v) Define secant of circle with diagram. (Marks 2)

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

Q.4 vii) Define cyclic quadrilateral. (Marks 2)

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

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

Q.5 a) Solve: $x^{2/3} + 54 = 15x^{1/3}$ (Marks 4)

Q.5 b) Find p the roots of the equation $x^2 - x + p^2 = 0$ differ by unity.

Q.6 a) If 2 is added in each number of the ratio 3:4, we get a new ratio 5:6 find the numbers. (Marks 4)

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

Q.7 a) Prove that $(A \cup B)' = A' \cap B'$ such that $U = \{1,2,3,4,5,6,7,8,9,10\}$,
 $A = \{1,3,5,7,9\}, B = \{2,3,5,7\}$ (Marks 4)

Q.7 a) Prove that $(A \cup B)' = A' \cap B'$ such that $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$,
 $A = \{1, 3, 5, 7, 9\}$, $B = \{2, 3, 5, 7\}$ (Marks 4)

Q.8 a) Prove that: $(\tan\theta + \cot\theta)(\cos\theta + \sin\theta) = \sec\theta + \operatorname{cosec}\theta$ (Marks 4)

Q.8 b) Inscribe a circle in a triangle ABC with sides $|AB| = 5$ cm, $|BC| = 3$ cm, $|CA| = 3$ cm. (Marks 4)

Q.9) Prove that a straight line, drawn from the center of a circle to bisect a chord (which is not a diameter) is perpendicular to the chord. (Marks 8)