## SSLC EKAMINATION 2020

## PASSING PACKAGE



PREPARED BY THE FACULTY OF<br>TRILLIUM PUBLIC SCHOOL, RT NAGAR BANGALORE-32

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## MATHEMATICS

## PASSING PACKAGE

## I. Theorems on Triangles -

1. State \& Prove Basic Proportionality Theorem. [Thale's Theorem]
2. State \& Prove AA Similarity criterion Theorem.
3. Theorem on Areas of similar Triangles.
4. State \& Prove Pythagoras Theorem.
5. State \& Prove converse of Pythagoras Theorem.
II. Theorems on Circles -
[3 Marks]
6. Prove that "The tangent at any point of a circle is perpendicular to the radius through the point of contact."
7. Prove that "The lengths of tangents drawn from an external point to a circle are equal."
III. Solving Graphically:
[4 Marks]
8. $x-2 y=0$
$3 x+4 y=20$
9. $x+y=5$
$x-y=8$
10. $x+3 y=6$
$2 x-3 y=12$
11. $2 x+y-6=0$ $4 x-2 y-4=0$
12. $5 x+y=17$
$2 x-2 y=2$
13. $x+y=10$
$x-y=2$
14. $2 x-y=2$
$4 x-y=4$
15. $y=2 x+1$
$x=2 y-5$

## IV. Ogive curve

[3 Marks]

1. Construct less than type \& more than type Ogive.
i.

| C.I | $0-3$ | $3-6$ | $6-9$ | $9-12$ | $12-15$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| f | 9 | 3 | 5 | 3 | 1 |

ii.

| C.I | $40-45$ | $45-50$ | $50-55$ | $55-60$ | $60-65$ | $65-70$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| f | 4 | 6 | 16 | 20 | 30 | 24 |

iii.

| C.I | $100-150$ | $150-200$ | $200-250$ | $250-300$ | $300-350$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| f | 15 | 12 | 10 | 8 | 5 |

iv.

| C.I | $100-120$ | $120-140$ | $140-160$ | $160-180$ | $180-200$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| f | 12 | 14 | 8 | 6 | 10 |

v.

| C.I | $50-55$ | $55-60$ | $60-65$ | $65-70$ | $70-75$ | $75-80$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| f | 2 | 8 | 12 | 24 | 38 | 16 |

1) 

| C.I | $1-5$ | $5-9$ | $9-13$ | $13-17$ | $17-21$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| f | 7 | 2 | 2 | 8 | 1 |

2) 

| C.I | $0-10$ | $10-20$ | $20-30$ | $30-40$ | $40-50$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| f | 3 | 5 | 9 | 5 | 3 |

3) 

| C.I | $15-25$ | $25-35$ | $35-45$ | $45-55$ | $55-65$ | $65-75$ | $75-85$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| f | 6 | 11 | 7 | 4 | 4 | 2 | 1 |

4) 

| C.I | $10-20$ | $20-30$ | $30-40$ | $40-50$ |
| :---: | :---: | :---: | :---: | :---: |
| f | 4 | 7 | 8 | 3 |

## VI. Coordinate Geometry <br> [2 Marks]

1. Find the distance between the points:
i. $(2,-2) \&(14,10)$
ii. $(8,-3) \&(0,9)$
iii. $(-5,-7) \&(-1,3)$
iv. $(1,7) \&(4,2)$
v. $(2,3) \&(6,6)$
2. Find the distance of the point $(3,4) \&$ the origin.
3. The distance between the point $(4,3) \&$ the origin is $\qquad$
4. Find the coordinates of the midpoint of the line segment joining the points.
i. $(2,3) \&(4,7)$
ii. $(6,2) \&(4,4)$
iii. $(8,5) \&(6,3)$
iv. $(4,5) \&(6,3)$
5. Find the coordinates of the points which divides the join of $(2,1) \&(7,6)$ in the ratio 3:2
6. Find the ratio in which $\mathrm{P}(-4,6)$ divides the line joining points $\mathrm{A}(-6,10)$ \& B(3,-8)
7. Find the coordinates of the points which divides the line segment joining the points $(-5,11) \&(4,-7)$ in the ratio $7: 2$
8. Find the ratio in which the point $(2,5)$ divides the line segment $(8,2) \&(-6,9)$.

## [3 Marks]

9. Find the value of $K$, if the points $\mathrm{A}(2,3) \mathrm{B}(4, \mathrm{~K}) \& \mathrm{C}(6,3)$ are collinear.
10.Find the perimeter of a triangle whose vertices have the coordinates
i. $(3,10)(5,2) \&(4,12)$
ii. $(-2,1)(4,6) \&(6,3)$
10. Find the area of a triangle whose vertices are
i. $\quad(1,1),(-4,6) \&(-3,-5)$
ii. $\quad \mathrm{A}(2,3), \mathrm{B}(4,4) \& \mathrm{C}(2,6)$
iii. $\quad(2,-2),(-2,1) \quad \&(5,2)$

## VII. Construction

[2+3=5 Marks]

## [2 Marks]

1. Construct a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of $60^{\circ}$.
2. Draw a pair of tangents to a circle of radius 4 cm so that angle between tangents is $60^{\circ}$.
3. Draw two tangents from a point 10 cm away from the centre of circle of radius 6 cm .
4. Draw a circle of radius 3 cm construct a pair of tangents to it, from a point 8 cm away from its centre.
5. Draw a line segment $\mathrm{AB}=6 \mathrm{~cm} \&$ divide it in the ratio $1: 2$.
6. Draw a tangent to a circle of radius 3 cm at any point on the circle.

## [3 Marks]

1. Draw a $\triangle \mathrm{ABC}$ with side base $\mathrm{BC}=8 \mathrm{~cm}$ \& altitude $4 \mathrm{~cm}, \&$ then construct another triangle whose sides are $5 / 3$ times the corresponding sides of $\triangle \mathrm{ABC}$.
2. Draw a right triangle in which the sides (other than hypotenuse) are of lengths 8 $\mathrm{cm} \& 6 \mathrm{~cm}$, then construct another triangle whose sides are $5 / 3$ times the corresponding sides of the given triangle.
3. Construct a $\triangle$ of sides $4 \mathrm{~cm}, 5 \mathrm{~cm} \& 6 \mathrm{~cm} \&$ then construct a similar $\triangle \odot$ whose sides are $2 / 3$ of the corresponding sides.
4. Draw a $\triangle \mathrm{ABC}$ with $\mathrm{BC}=6 \mathrm{~cm}, \mathrm{AB}=5 \mathrm{~cm}, \&<\mathrm{ABC}=60^{\circ}$. Then construct a $\triangle$ ${ }^{\text {le }}$ whose sides are $3 / 5$ of the corresponding side of $\triangle \mathrm{ABC}$.
5. Draw a $\triangle \mathrm{ABC}$ with sides $\mathrm{BC}=7 \mathrm{~cm},<\mathrm{B}=45 \&<\mathrm{A}=105$. Then construct a similar triangle whose sides are $4 / 3$ of the corresponding sides.

## VIII. Polynomials

[3 Marks]

1. If $3 \&-3$ are two zeros of the polynomials $\mathrm{P}(\mathrm{x})=x^{4}+x^{3}-11 x^{2}-9 x+18$ $\mathrm{x}+\mathrm{x}-11 \mathrm{x}-9 \mathrm{x}+18$, then find the remaining two zeros.
2. Write the number of zeros of the polynomial $\mathrm{P}(\mathrm{x})=x^{3}+2 x^{2} \mathrm{x}+6$.
3. Write the general form \& degree of
(i) Linear polynomial
(ii) Quadratic Polynomial
(iii) Cubic Polynomial
4. Find the zeros of the polynomial
(i) $6 x^{2}-3-7 x$
(ii) $3 \mathrm{x}^{2}-\mathrm{x}-4$
(iii) $4 u^{2}-8 u$
(iv) $x^{2}-15$
5. Divide
i. $x^{4}-3 x^{2}+4 x+5$ by $x^{2}+1-x$
ii. $x^{3}-3 x^{2}+5 x-3$ by $x^{2}-2$
iii. $\quad x^{4}-5 x+6$ by $2-x^{2}$
iv. $3 x^{4}+5 x^{3}-7 x^{2}+2 x+2$ by $x^{2}+3 x+1$
v. $x^{6}-2 x^{5}-x+2$ by $x-2$
6. If the polynomial $x^{3}-3 x^{2}+x+2$ is divided by $g(x)$, then the remainder is $(-2 x+4) \&$ quotient is ( $\mathrm{x}-2$ ). Find $\mathrm{g}(\mathrm{x})$
7. Find all the zeros of $2 x^{4}-3 x^{3}-3 x^{2}+6 x-2$ two of its zeros are $\sqrt{ } 2 \quad \&-\sqrt{ } 2$.
8. Find the Quadratic polynomial whose sum \& product are:
(i) $1 / 4 \&-1$
(ii) $2+\sqrt{3} \& 2-\sqrt{3}$.
9. Find the sum and product of zeros of the polynomial $x^{2}-8-2 x$.

## IX. Quadratic Equations:

1. Find the roots of the following:
(i ) $3 x^{2}-5 x+2=0$
(ii) $2 x^{2}-3 x+1$
(iii) $x^{2}-12 x+27=0$
(iv) $\mathrm{x}^{2}-2 \mathrm{x}-4=0$
(v) $\mathrm{x}^{2}-7 \mathrm{x}+12$
(vi) $x^{2}+6 x-7=0$
(vii) $15 m^{2}-11 m+2=0$
(viii) $6 x^{2}+7 x-10=0$
2. Find the nature of the roots:
(i) $2 x^{2}-3 x+5=0$
(ii) $3 x^{2}-4 \sqrt{3} x+4=0$
(iii) $2 x^{2}-6 x+3=0$
(iv) $x^{2}-2 x-3=0$
(v) $4 x^{2}-5 x+3=0$
3. Find the value of $K$ for which the equation $2 x^{2}+k x+3=0$ has equal roots.

## X. Linear Equations

(2 M)

1. Solve for $\mathrm{x} \& \mathrm{y}$ or solve the following equations.
(i) $2 x-y-6=0$
(ii) $2 x+y=3$
(iii) $3 x+4 y=10$
(iv) $10 x+3 y=75$
$2 x-y-2=0$
$x+3 y=-1$
$2 x-2 y=2$
$6 x-5 y=11$
(v) $2 x+y=5$

$$
3 x+2 y=8
$$

## XI. Real Numbers:

Prove the following are Irrationals.
(i) $3+\sqrt{ } 5$
(ii) $3-\sqrt{ } 2$
(iii) $5-\sqrt{ } 3$
(iv) $2+\sqrt{ } 5$
(v) $3+2 \sqrt{ } 5$
(vi) $\sqrt{ } 2$
(vii) $\sqrt{5}$
(viii) $\sqrt{ } 3$
(ix) $1 / \sqrt{ } 2$
(x) $7 \sqrt{ } 5$

## XII. Probability

1. Two cubical dice whose faces are numbered 1 to 6 are rolled simultaneously once. Find the probability that the sum of the two numbers occurring on their top faces is more than 7.
2. The probability of an event ' $E$ ' is 0.05 then the probability of an event 'Not $E$ ' is
3. A die is thrown once what is the probability of getting (i) a cube number (ii) even numbers.
4. A die is numbered as $\sqrt{ } 1, \sqrt{ } 2, \sqrt{ } 3, \sqrt{ } 4, \sqrt{ } 5 \& \sqrt{ } 6$. Find the probability of getting (i) Irrational number (ii) an even number.
XIII. Trigonometry
5. Trigonometric Ratios \& Values.
6. Standard angles of Trigonometry.
7. Complementary angles.
8. Trigonometric Identities.
9. State Basic Proportionality Theorem?
10. State Converse of Basic Proportionality Theorem.
11. State Pythagoras Theorem.
12. State Converse of Pythagoras Theorem.
13. Statement of Area Theorem.
14. Statement of AA criterion or Equiangular Theorem.
15. When do you say two triangles are similar?
16. State Baudhayan Theorem.
17. Conditions of lines [constituency of lines].
10.Tangents and secants.
11.Euclid's division algorithm.
12.State Fundamental Theorem of Arithmetic.
18. Express each number as a product of its Prime factors.
14.Terminating or non - terminating decimal expansion.
15.Degree of a polynomial \& Zeros of a Polynomial.
19. Value of a Polynomial.
17.Standard form of a (i) Linear Polynomial
(ii)Quadratic Polynomial (iii) Cubic Polynomial.
18.Standard form of a Linear Polynomial, Quadratic Polynomial \& Cubic Polynomial.
19.Formula to find the roots of a Quadratic equation.
20.What is discriminant?
21.Nature of roots of Q.E.
22.Formula of Probability.
23.Complementary events.

III Theme:
Trigonometry.
[9 Marks]

1. If $\operatorname{Sin} \mathrm{A}=1 / \sqrt{ } 2$ the magnitude of $\mid \mathrm{A}$ is $\qquad$ .
2. If $\operatorname{Sin} \theta=3 / 5 \& \operatorname{Cos} \theta=4 / 5$ find $\operatorname{Sin}^{2} \theta+\operatorname{Cos}^{2} \theta$.
3. Find the value of $\operatorname{Sin} 30^{\circ}+\operatorname{Cos} 60^{\circ}$.
4. In the fig, the value of $\operatorname{Sin} \operatorname{C}$ is A

5. Evaluate : (i) $\underline{\operatorname{Sin} 18^{\circ}}$
(ii) $\operatorname{Cos} 48^{\circ}-\operatorname{Sin} 42^{\circ} \quad$ (iii) $\underline{\tan 26^{\circ}}$
(iv) $\operatorname{Cosec} 31^{\circ}-\operatorname{Sec} 59^{\circ}$ $\operatorname{Cos} 72^{\circ}$ $\operatorname{Cot} 64^{\circ}$
6. Find the Value of $\operatorname{Sin} 90^{\circ}+\tan 45^{\circ}$
7. Show that $\tan 48^{\circ} \tan 23^{\circ} \tan 42^{\circ} \tan 67^{\circ}=1$
8. Show that $\operatorname{Cos} 38^{\circ} \operatorname{Cos} 52^{\circ}-\operatorname{Sin} 38^{\circ} \operatorname{Sin} 52^{\circ}=0$
9. Trigonometric Identities.
