SUMMATIVE ASSESSMENT – I, 2013
MATHEMATICS
Class – IX

Time Allowed : 3 hours   Maximum Marks : 90

General Instructions:

All questions are **compulsory**.

The question paper consists of 31 questions divided into four sections A, B, C and D. Section-A comprises of 4 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each; Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 11 questions of 4 marks each.

There is no overall choice in this question paper

Use of calculator is not permitted.

SECTION – A

Question numbers 1 to 4 carry 1 mark each.

1. Express $0.\overline{3}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.   1

2. Find the value of 95×96.   1

3. Write the measure of each exterior angle of an equilateral triangle.   1

4. The co-ordinates of a point whose ordinate is -3 and which lies on y-axis are_____ .   1
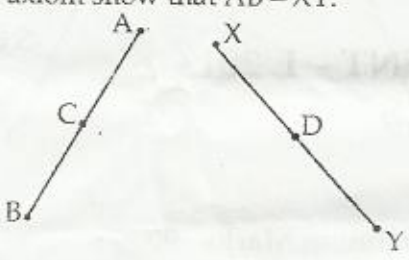
SECTION – B

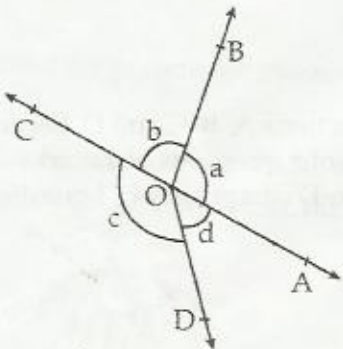**Question numbers 5 to 10 carry 2 marks each.**

5. Express $2.\overline{3}$ in the from of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.   2

6. Factorise the polynomial $4\sqrt{3}\, x^2 + 5x - 2\sqrt{3}$ 2

7 In the figure AC = XD. C is the mid-point of AB and D is the mid-point of XY. Using Euclid's   2
axiom show that AB = XY.
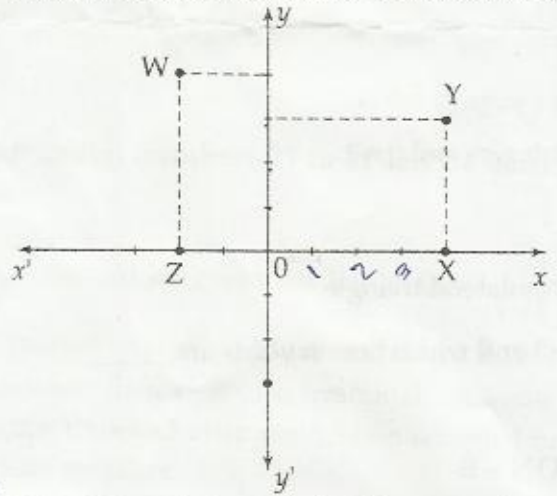
8   2

In figure a + b = c + d. Prove that AOC is a straight line.

9 Write the co-ordinates of X, Y, Z and W from the figure.   2

10 Using Heron's formula find the area of an equilateral triangle whose perimeter is 24cm. (Take   2
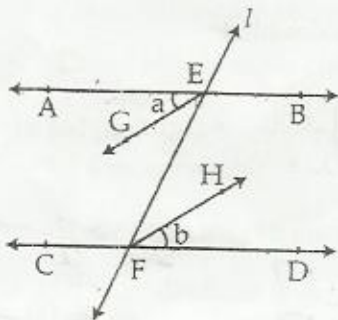$\sqrt{3} = 1.732$)

Question numbers 11 to 20 carry 3 marks each.

11. Represent $\sqrt{8.5}$ on the number line. 3

12. Express $18.\overline{48}$ in the form of P/q, where p and q are integers, $q \neq 0$ 3

13. Find the values of a and b if the polynomial $x^4 + ax^3 + 2x^2 - 3x + b$ is exactly divisible by the polynomial $x^2 - 1$. 3

14. For what value of 'p', the polynomial $2x^3 + px^2 + 11x + p + 3$ is exactly divisible by $(2x - 1)$? 3

15.

In figure, a transversal l cuts two lines AB and CD at E and F respectively. EG is the bisector of ∠AEF and FH is the bisector of ∠EFD such that ∠a = ∠b. Show that EG∥FH and AB∥CD.

3

16.
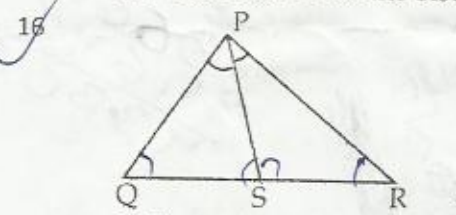
In figure PR > PQ and PS bisects ∠ QPR. Prove that ∠ PSR >∠ PSQ.

17. In the given figure, AC∥DE and AD∥CE find x and y, when it is given that ∠BAC = 70° and ∠DEC = 55°. 3

18
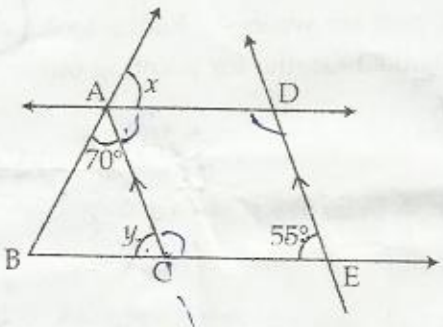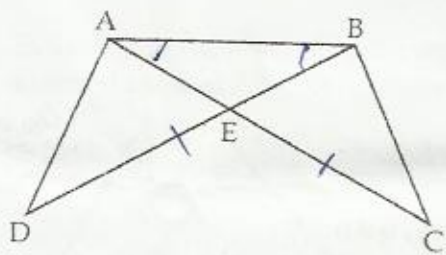
In given figure, $\angle EAB = \angle EBA$ and $AC = BD$. Prove that $AD = BC$.
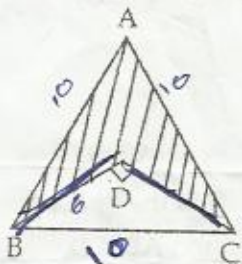
19 Find the percentage increase in the area of a triangle if its each side is doubled.   3

20 In the given figure $\triangle ABC$ is equilateral triangle with side 10 cm and $\triangle DBC$ is right angled at   3
$\angle D = 90°$. If $BD = 6$ cm, find the area of the shaded portion $(\sqrt{3} = 1.732)$

खण्ड-द / SECTION - D

Question numbers 21 to 31 carry 4 marks each.

21

Geetha told her classmate Radha that " $\sqrt{\dfrac{\sqrt{2}-1}{\sqrt{2}+1}}$ is an irrational number". Radha replied that   4

"you are wrong" and further claimed that "If there is a number 'x' such that x^3 is an irrational
number, then x^5 is also irrational". Geetha said, "No Radha, you are wrong". Radha took
some time and after verification accepted her mistakes and thanked Geetha for pointing out
these mistakes.

(i) Justify both the statements.
(ii) What value is depicted from this question ?

22

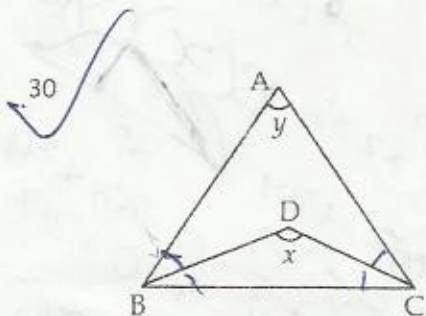If $x = 4 - \sqrt{15}$, find the value of $\left(x + \dfrac{1}{x}\right)^2$.

23. Factorise: $x^3 - 6x^2 + 11x - 6$

24. Simplify $\dfrac{\left(a^2-b^2\right)^3 + \left(b^2-c^2\right)^3 + \left(c^2-a^2\right)^3}{(a-b)^3+(b-c)^3+(c-a)^3}$

25. Factorise : $x^3 - 3x^2 - 10x + 24$

26. Find the value of 'p' if the polynomial $p(x) = x^4 - 2x^3 + 3x^2 - px + 3p - 7$ when divided by $(x+1)$ leaves the remainder 19. Also find the remainder when p(x) is divided by $x+2$.

27. In figure AO and DO are the bisectors of $\angle A$ and $\angle D$ respectively of the quadrilateral ABCD. Prove that $\angle AOD = \dfrac{1}{2}(\angle B + \angle C)$.

28. In the given figure, PS is the bisector of $\angle QPR$ and $PT \perp QR$. Show that $\angle TPS = \dfrac{1}{2}(\angle Q - \angle R)$

29. If two isosceles triangles have a common base, prove that the line joining their vertices bisects them at right angles.

30

In △ABC, BD and CD are internal bisector of ∠B and ∠C respectively. Prove that $180° + y = 2x$.

$2a + 2c = 180° - \angle y$

$a + c = 90° - \frac{1}{2}\angle y$

$90° - \frac{1}{2}\angle y + \angle x = 180°$

$90° + x = 180° + \frac{1}{2}\angle y$

$x = 90° + \frac{1}{2}\angle y$

$(2x) = 180° + \angle y$

31 In the given figure DE∥AF, AD∥FG, find $x°$, $y°$

②

4

$\frac{1}{0.0064}$

$\frac{1}{0.04}$

$3/x^{1/4} = \frac{1}{0.04}$

$2x + 2y = 180°$

$2x + 2y = 180°$

x
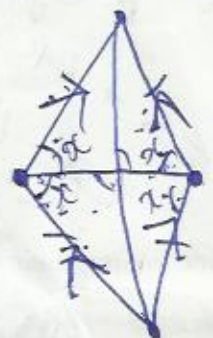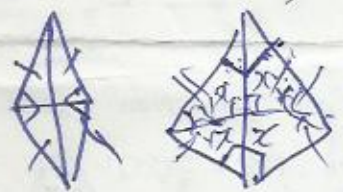
$2x + 2y + 2x + 2y = 360°$

$x(x + y + x + y) = 180°$

$x + y + x + y = 180°$

$90° + y + 90° + y = 180°$

$90° + \frac{1}{2}y$

*****

$2x = 360°$

$4x = 180°$

$x = 280°$ 5.

② ④ ③