



Summative Assessment-I
Topper Sample Paper - 1
MATHEMATICS
CLASS IX

Time: 3 to $3\frac{1}{2}$ hours

Maximum Marks: 80

GENERAL INSTRUCTIONS:

1. All questions are compulsory.
2. The question paper is divided into four sections
 Section A: 8 questions (1 mark each)
 Section B: 6 questions (2 marks each)
 Section C: 10 questions (3 marks each)
 Section D: 10 questions (4 marks each)
3. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks and 2 questions of four marks each.
4. Use of calculators is not allowed.

Section - A

- Q.1 If $x^2 + kx + 6 = (x + 2)(x + 3)$ for all x , the value of k is
 (A) 1 (B) -1 (C) 5 (D) 3
- Q.2 $p(x) = 2x^4 - 3x^3 + 2x^2 + 2x - 1$ is divided by $(x-2)$ and $q(x) = 3x^3 - 2x^2 + x - 1$ is divided by $(x-1)$. So, twice the sum of the remainders is:
 (A) 21 (B) 35 (C) 54 (D) 40
- Q.3 In $\triangle ABC$ and $\triangle DEF$, $AB = DF$ and $\angle A = \angle D$. The two triangles will be congruent by SAS axiom if:
 (A) $BC = EF$ (B) $AC = DE$ (C) $BC = DE$ (D) $AC = EF$
- Q. 4 If a straight line falling on two straight lines makes the interior angles on the same side of it, whose sum is 120° , then the two straight lines, if produced indefinitely, meet on the side on which the sum of angles is
 (A) less than 120°
 (B) greater than 120°
 (C) is equal to 120°
 (D) greater than 180°
- Q.5 The lengths of a triangle are 6 cm, 8 cm and 10 cm. Then the length of perpendicular from the opposite vertex to the side whose length is 8cm is:



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- (A) 5 cm
- (B) 4 cm
- (C) 6 cm
- (D) 2 cm

Q.6 If $(\sqrt{5} + \sqrt{6})^2 = a + b\sqrt{30}$ then a and b respectively are

- (A) 12 and 2
- (B) $\sqrt{5}$ and $\sqrt{6}$
- (C) 11 and 2
- (D) 10 and $2\sqrt{30}$

Q.7 The sides of a triangular park are in the ratio of 2: 6: 7 and its perimeter is 300 m. Then its area is:

- (A) $154\sqrt{57}$ cm²
- (B) $215\sqrt{45}$ cm²
- (C) $340\sqrt{56}$ cm²
- (D) $300\sqrt{55}$ cm²

Q.8 The area of a rectangle is $x^2+9x+14$, what are the dimensions of rectangle if $x=2$.

- Options:
- (A) 14 and 2
 - (B) 6 and -6
 - (C) 9 and 4
 - (D) 18 and 2

Section - B

Q.9 Evaluate: $\sqrt[3]{(343)^{-2}}$

Q.10 In the fig.1, sides QP and RQ of ΔPQR are produced to points S and T respectively. If $\angle SPR = 135^\circ$ and $\angle PQT = 110^\circ$, find $\angle PRQ$.

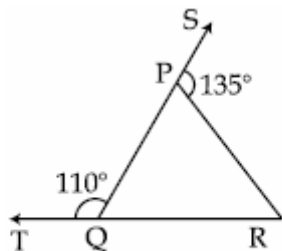


Fig. 1

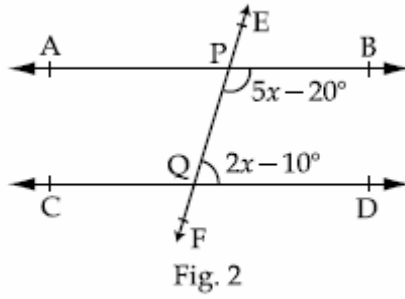


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Q.11 Factorise: $7\sqrt{2}x^2 - 10x - 4\sqrt{2}$

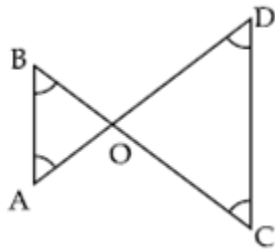
Q.12 If $a + b + c = 7$ and $ab + bc + ca = 20$, find the value of $a^2 + b^2 + c^2$.

Q.13 In fig.2, $AB \parallel CD$ then find the value of x .



OR

In fig, $\angle B < \angle A$ and $\angle C < \angle D$ show that $AD < BC$.



Q.14 See fig.4, and write the following:

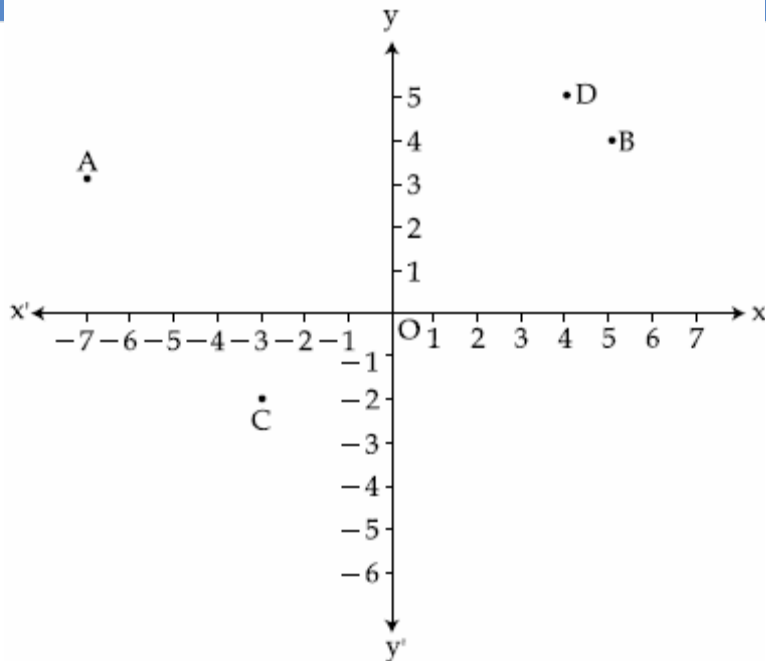


Fig. 4

- (i) Co - ordinates of point A
- (ii) Abscissa of point D
- (iii) The point indentified by the co - ordinates (5,4)
- (iv) Co - ordinates of point C

Section - C

Q.15 If $x = (3 + \sqrt{8})$, find the value of $\left(x^2 + \frac{1}{x^2}\right)$.

OR

Express $5.\overline{347}$ in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$.

Q.16 Factorize $(x - 3y)^3 + (3y - 7z)^3 + (7z - x)^3$

Q.17 Factorise: $2\sqrt{2}a^3 + 8b^3 - 27c^3 + 18\sqrt{2}abc$.

Q.18 In fig.5, ΔABC , is an isosceles triangle in which $AB = AC$, side BA is produced to D such that $AD = AB$. Show that $\angle BCD$ is a right angle.

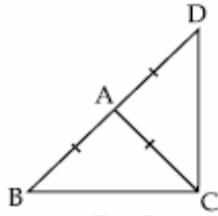


Fig. 5

Q.19 In fig.6, D is a point on side BC of ΔABC such that $AD = AC$. Show that $AB > AD$.

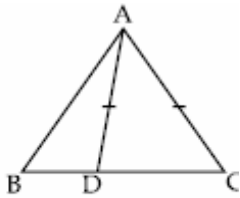


Fig. 6

Q.20 A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 15 cm, 14 cm and 13 cm and the parallelogram stands on the base 15 cm, find the height of parallelogram.

Q.21 In the fig.7, $\angle X = 72^\circ$, $\angle XZY = 46^\circ$. If YO and ZO are bisectors of $\angle XYZ$ and $\angle XZY$ respectively of ΔXYZ , find $\angle OYZ$ and $\angle YOZ$.

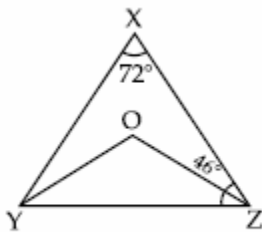


Fig. 7

Or

In fig.8, AD and CE are the angle bisectors of $\angle A$ and $\angle C$ respectively. If $\angle ABC = 90^\circ$ then find $\angle AOC$.

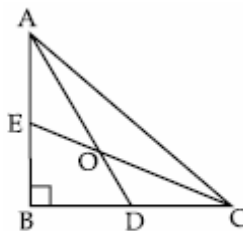


Fig. 8

Q.22 In ΔABC , BE and CF are altitudes on the sides AC and AB respectively such that $BE = CF$. Using RHS congruency rule, prove that $AB = AC$.



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Q.23 Find the value of a and b if $\frac{\sqrt{11} + \sqrt{7}}{\sqrt{11} - \sqrt{7}} = a - \sqrt{77}b$.

OR

If $\frac{2}{\sqrt{3} + \sqrt{5}} + \frac{5}{\sqrt{3} - \sqrt{5}} = a\sqrt{3} + b\sqrt{5}$, find a and b.

Q.24 Find the area of a square the coordinates of whose vertices are (0,0),(2,0),(2,2) and (0,2).

Section - D

Q.25. Find the values of a and b if:

$$\frac{7 + 3\sqrt{5}}{3 + \sqrt{5}} - \frac{7 - 3\sqrt{5}}{3 - \sqrt{5}} = a + \sqrt{5}b$$

Or

If $a = 7 - 4\sqrt{3}$, find the value of $\sqrt{a} + \frac{1}{\sqrt{a}}$

Q.26 The polynomial $p(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$ when divided by $(x + 1)$ leaves the remainder 19. Find the value of a. Also find the remainder, when $p(x)$ is divided by $x + 2$.

Or

Find the values of a and b so that $(x + 1)$ and $(x - 1)$ are factors of

$$x^4 + ax^3 - 3x^2 + 2x + b.$$

Q.27 Prove "If two lines intersect each other, then the vertically opposite angles are equal".

Q.28 In the fig.9, the sides AB and AC of ΔABC are produced to point E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at point O, then prove that

$$\angle BOC = 90^\circ - \frac{1}{2}\angle BAC.$$

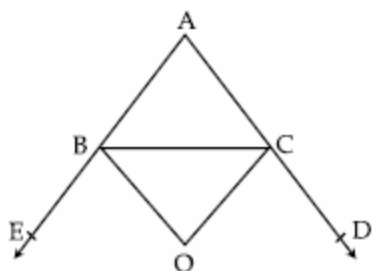


Fig. 9



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Q.29 (i) Multiply $9x^2 + 25y^2 + 15xy + 12x - 20y + 16$ by $3x - 5y - 4$ using suitable identity.

(ii) Factorise: $a^2 + b^2 - 2(ab - ac - bc)$.

Q.30 In the fig.10, D and E are points on the base BC of a ΔABC such that $AD = AE$ and $\angle BAD = \angle CAE$. Prove that $AB = AC$.

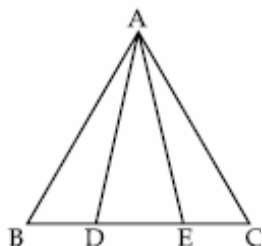


Fig. 10

Q.31 Find the value of:

$$\frac{1}{3 - \sqrt{8}} - \frac{1}{\sqrt{8} - \sqrt{7}} + \frac{1}{\sqrt{7} - \sqrt{6}} - \frac{1}{\sqrt{6} - \sqrt{5}} + \frac{1}{\sqrt{5} - 2}$$

Q.32 Factorize: $\frac{1}{27}(2x + 5y)^3 + \left(-\frac{5}{3}y + \frac{3}{4}z\right)^3 - \left(\frac{3}{4}z + \frac{2}{3}x\right)^3$

Q.33 Find the perimeter of a triangle whose vertices are $(0,4), (3,0)$ and $(-3,0)$.

Q.34 (i) In triangle ABC, $AB = BC$; angle B is half of angle A. Is $AB > AC$? Give reason for your answer

(ii) The sides of AB, BC, AC a triangle ABC are 2.8 cm, 3.7 cm and 4.1 cm respectively. What is the relationship between the angles A, B, and C?