संकलित परीक्षा – I, 2014 KAAP9E5

SUMMATIVE ASSESSMENT – I, 2014

गणित / MATHEMATICS

कक्षा – IX / Class – IX

SECTION – A

Question numbers 1 to 4 carry 1 mark each.

1 Find the product $\sqrt[3]{2}\,.\,\sqrt[4]{2}\,.\,\sqrt[12]{32}$. 1

2 Find one factor of $(9x^2-1)-(1+3x)^2$. 1

3 An exterior angle of a triangle measures 140°. If the interior opposite angles are in the ratio 3 : 1 then find the angles of the triangle. 1

4 What is the x-co odinate of any point on the y-axis ? 1

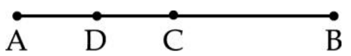
SECTION – B

Question numbers 5 to 10 carry 2 marks each.

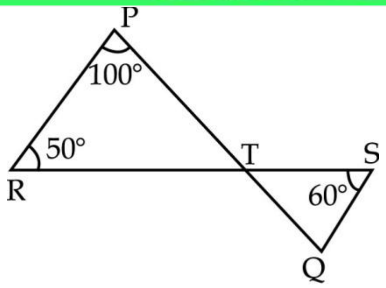
5 Insert three rational numbers between $\frac{3}{5}$ and $\frac{5}{7}$. 2

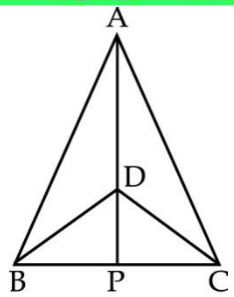
6 For what value of k is the polynomial $p(x)=2x^3-kx^2+3x+10$ exactly divisible by $(x+2)$? 2

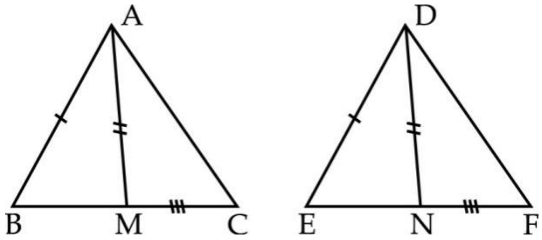
7 In figure C is the mid-point of AB and D is the midpoint of AC. Prove that $AD=\frac{1}{4}AB$. 2

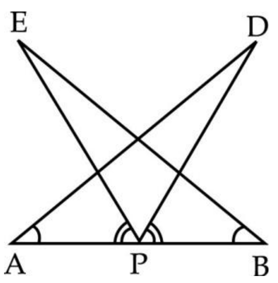


8 In figure, if lines PQ and RS intersect at point T, such that $\angle PRT=50°$, $\angle TSQ=60°$ and $\angle RPT=100°$, find $\angle SQT$. 2

		
9	If a point P(2, 3) lies in first quadrant, then what will be the co-ordinates of a point Q opposite to it in fourth quadrant having equal distance from x-axis ?	2
10	The semi-perimeter of a triangle is 132 cm. The product of the difference of semi-perimeter and its respective sides is 13200 cm^3. Find the area of the triangle.	2
	SECTION – C	
	Question numbers 11 to 20 carry 3 marks each.	
11	If $\frac{1+\sqrt{2}}{1-\sqrt{2}} + \frac{1-\sqrt{2}}{1+\sqrt{2}} = a + b\sqrt{2}$, then find a and b .	3
12	Find the value of a and b if $\frac{5+\sqrt{3}}{7-4\sqrt{3}} = a + b\sqrt{3}$.	3
13	If $a-b=7$ and $a^2+b^2=85$, find a^3-b^3.	3
14	If $x+a$ is a factor of $x^4-a^2x^2+3x-a$, then find the value of a.	3
15	ABCD is a square. X and Y are points on the sides AD and BC such that AY= BX. Prove that $\angle XAY = \angle YBX$	3
16	In the given figure ΔABC and ΔDBC are two triangles on the same base BC and vertices A and D are on the same side of BC, AD is extended to intersect BC at P. Show that : (i) $\Delta ABD \cong \Delta ACD$ (ii) $\Delta ABP \cong \Delta ACP$	3



17	If a transversal intersects two parallel lines, then prove that bisectors of alternate interior angles are parallel.	3
18	In figure two sides AB and BC and median AM of ΔABC are respectively equal to sides DE and DF and the median DN of ΔDEF. Prove that ΔABC≅ΔDEF. 	3
19	Find the area of the trapezium in which parallel sides are 25 cm and 10 cm and non-parallel sides are 14 cm and 13 cm.	3
20	The adjacent sides of a parallelogram ABCD are AB □ 34 cm, BC □ 20 cm and diagonal AC = 42 cm. Find the area of the parallelogram.	3
	SECTION – D	
	Question numbers 21 to 31 carry 4 marks each.	
21	Varun was facing some difficulty in simplyfying $\frac{1}{\sqrt{7}-\sqrt{3}}$. His classmate Priya gave him a clue to rationalise the denominator for simplification. Varun simplified the expression and thanked	4

	Priya for this goodwill. How Varun simplified $\frac{1}{\sqrt{7}-\sqrt{3}}$? What value does it indicate?	
22	Prove that : $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\text{.........}+\frac{1}{\sqrt{8}+3}=2$	4
23	Simplify $\frac{\left(a^2-b^2\right)^3+\left(b^2-c^2\right)^3+\left(c^2-a^2\right)^3}{(a-b)^3+(b-c)^3+(c-a)^3}$	4
24	Without actual division prove that $x^4+2x^3-2x^2+2x-3$ is exactly divisible by x^2+2x-3.	4
25	Show by long division that $2x+3$ is a factor of $p(x)=4x^4+8x^3+5x^2+x-3$.	4
26	Find the value of k, if $(x-3)$ is a factor of $p(x)=2x^3-5x^2+3x+k$.	4
27	Show that the perimeter of a Δ is greater than the sum of its three medians.	4
28	Prove that the sum of three angles of a triangle is 180°. Using this result, find the value of x and all three angles of a triangle if the angles are $(2x-7)°$, $(x+25)°$ and $(3x+12)°$.	4
29	Prove that the angles opposite to equal sides of a triangle are equal.	4
30	In the given figure AB is a line segment and p is its mid-point. D and E are points on the same side of AB such that $\angle BAD=\angle ABE$ and $\angle EPA=\angle DPB$. Show that : (i) $\Delta DAP \cong \Delta EBP$, (ii) $AD=BE$ 	4
31	If two lines intersect each other, then prove that the vertically opposite angles are equal.	4