**KENDRIYA VIDYALAYA SANGATHANGUWAHATI REGION**

**HALF YEARLY EXAM (2018 - 19)**

**Class- IX**

**Mathematics (SET – 1)**

**Time allowed: 3 Hours Max. Marks: 80**

**General Instructions:**

**(i) All questions are compulsory.**

**(ii) The question paper consists of 30 questions divided into four sections A, B, C and D.**

**(iii)Section A contains 6 questions of 1 mark each. Section B contains 6 questions of 2 marks each. Section C contains 10 questions of 3 marks each. Section D contains 8 questions of 4 marks each.**

**(iv) There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.**

**(v) Use of calculators is not permitted**

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|  | **Section A****Question numbers 1 to 6 carry 1 mark each.** |
| **1** | **Represent** $\sqrt{5}$ **on number line.** |
| **2** | **If (x – 1) is a factor of the polynomial p(x) = 3x4– 4x3– ax + 2 then find the value of ‘a’?** |
| **3** | **In the given fig, find the value of x.**  |
| **4** | **Express the equation 5x – y = 5 in the general form & indicate the values of a, b and c.** |
| **5** | **Give the equation of one line passing through (2, 1). How many more such lines are there and why?** |
| **6** | **In the given fig, if AOB is a line then find the measure of BOC, COD &DOA.** |
|  | **Section B****Question numbers 7 to 12 carry 2 marks each.** |
| **7** | **If  then find value of a & b.** |
| **8** | **If x = 2 & y = 1 is the solution of the linear equation 2x + 3y + k = 0, find the value of k.** |
| **9** | **Simplify:** $\left(\frac{12^{^{1}/\_{5}}}{27^{^{1}/\_{5}}}\right)^{^{5}/\_{2}}$ |
| **10** | **In which quadrants do the following points lie? (a) (2, – 1) (b) (–1, 7) (c) (– 2, – 3) (d) (4, 5)** |
| **11** | **Find a value of p for which x = – 2, y = – 1 is a solution of the linear equation 5x + 2py = 2 p** |
| **12** | **Write any two Euclid’s postulate.** |
|  | **Section C****Question numbers 13 to 22 carry 3 marks each.** |
| **13** | **Simplify:**  |
| **14** | **Factorize: x3 + 13x2 + 32x + 20.** |
| **15** | **From given figure write the following :** 1. **The coordinates of P**
2. **The abscissa of the point Q**
3. **The ordinate of the point R**
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| **16** | **Find the three different solutions for the equation 3x–8y = 27.** |
| **17** | **In countries like USA & Canada, temperature is measured in Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius. F = C +32**1. **If the temperature is 300 C, what is the temperature in Fahrenheit?**
2. **If the temperature is 950 F, what is the temperature in Celsius?**
3. **Find the temperature which is numerically the same in both Fahrenheit &Celsius?**
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| **18** | **Prove that every line segment has one and only one mid–point.**  |
| **19** | **If remainder is same when polynomial p(x) = x3+ 8x2+17x + ax is divided by (x + 2) & (x + 1), find the value of a.**  |
|  | **OR** |
|  | **Using long division method show that the polynomial p(x) = x3 + 1 is divisible by q(x) = x + 1. Verify your result using Factor Theorem.** |
| **20** | **Given a polynomial p(x) =x2– 5x+ 4.**1. **Find the value of the polynomial p(x) at x= 2.**
2. **Check whether x is a factor of p(x).**
3. **Factorise p(x).**
 |
|  | **OR**  |
|  | **If (x + 5) is a factor of x3+ 2x2– 13x + 10, find the other factors.** |
| **21** | **Observe the points plotted in the figure and find the following**1. **The co-ordinates of E**
2. **The point with the co-ordinates (– 4, – 1)**
3. **The abscissa of A – abscissa of B**
4. **The ordinate of C + ordinate of F.**

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|  | **OR**  |
|  | **(i) Plot the points A (0, 4), B (– 3, 0), C (0, – 4), D (3, 0)**1. **Name the figure obtained by joining the points A, B, C, D.**
2. **Also, name the quadrants in which sides AB and AD lie.**
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| **22** | **Express the linear equation 2 = 3x in the form ax + by + c = 0 and indicate the values of a, b & c. Also give the geometrical representation of above equation in two variables.** |
|  | **OR**  |
|  | **Express the equation y = 2x + 3 in the standard form & find two solutions. Is (2, 3) its solution?** |
|  | **Section D****Question numbers 23 to 30 carry 4 marks each.** |
| **23** | **Simplify:**$\frac{\sqrt{6}}{\sqrt{2} + \sqrt{3}}+\frac{3\sqrt{2}}{\sqrt{6} + \sqrt{3}}-\frac{4\sqrt{3}}{\sqrt{6} + \sqrt{2}}$ |
| **24** | **If ax3 + bx2 + x – 6 has x + 2 as a factor and leaves remainder 4 when divided by x – 2, find the values of a and b.** |
| **25** | **Show that the line segments joining the mid - points of opposite sides of quadrilateral bisect each other.** |
|  | **OR**  |
|  | **In a quadrilateral ABCD, B = 1300, C = 600, angle bisectors of A and D meet at P. Find  APD.**  |
| **26** | **Prove that if two lines intersect, the vertically opposite angles are equal.** |
|  | **OR**  |
|  | **In the given fig., POQ is a line. Ray ORPQ, OS is another ray lying between rays OP and OR. Prove that ROS =** $\frac{1}{2}$**(QOS –POS).** |
| **27** | **Prove that angles opposite to equal sides of an isosceles triangle are equal.** |
|  | **OR**  |
|  | **ABC is a triangle, in which altitudes BE and CF to sides AC and AB respectively are equal. Show that ABE ACF. Also, show that ABC is an isosceles triangle.**  |
| **28** | **Solve the equation 2y + 3 = 3y – 5 & represent the solution(s) on (i) the number line ii) the Cartesian plane**  |
| **29** | **Verify: x3 + y3 + z3 – 3xyz = ( x + y + z ).** |
| **30** | **If** $x= \left(2+\sqrt{5}\right)^{^{1}/\_{2}}+\left(2-\sqrt{5}\right)^{^{1}/\_{2}}\&y=\left(2+\sqrt{5}\right)^{^{1}/\_{2}}-\left(2-\sqrt{5}\right)^{^{1}/\_{2}}$ **then evaluate x2 + y2.** |