

UNIT TEST-I—2017-18
CLASS-IX
SUBJECT-MATHEMATICS

Time : 3 Hours

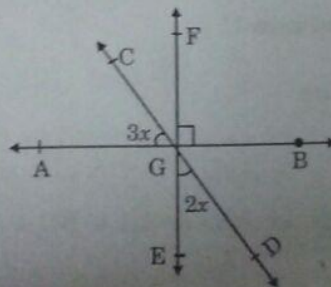
M.M. : 80

General Instructions :

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into 4 sections A, B, C and D. Section A comprises of 6 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 8 questions of 4 marks each.
3. There is no overall choice.
4. Use of calculators is not permitted.

Section-A

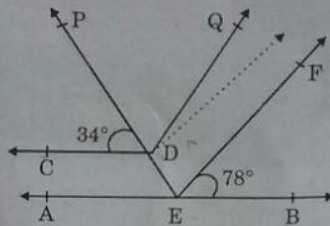
1. Give example of two irrational numbers whose sum is a rational number.
2. Evaluate $(102)^3$ using an identity.
3. Find the remainder when $x^3 - 4x^2 + 7x - 1$ is divided by $x - 1$.
4. The angles of a triangle are $(x - 40)^\circ$, $(x - 20)^\circ$ and 50° . Find x .
5. In the given figure, find x .



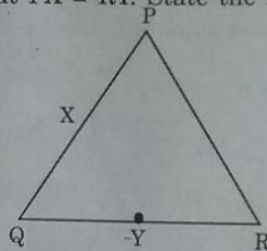
6. Find the value of $[(16)^{64}]^{64}$

Section-B

7. Represent $0.\overline{123}$ as a rational number.
8. If $x - y = 4$, $xy = 21$, find the value of $x^3 - y^3$.
9. If $(x - \frac{1}{2})$ is a factor of $f(x) = 8x^3 + ax^2 + 2 - 4x$, find a .
10. Factorise : $1 - 2ab - (a^2 + b^2)$
11. In the given figure, $AB \parallel CD$ and $EF \parallel DQ$. Find $\angle PDQ$ and $\angle DEF$.

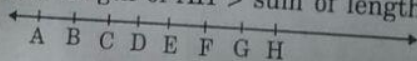


12. In a $\triangle PQR$, X and Y are points on PQ and QR respectively. If $PQ = QR$ and $QX = QY$ show that $PX = RY$. State the Euclid's axiom used.



Section-C

13. Represent $\sqrt{5.4}$ on a number line.
14. Factorise $a^3 - b^3 + 1 + 3ab$.
15. Show that length of AH > sum of lengths of AB + BC + CD. Give reason.

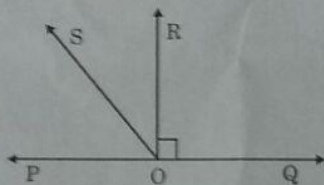


State one more Euclid's axiom.

16. Simplify : $\left(\frac{81}{16}\right)^{\frac{-3}{4}} \times \left[\left(\frac{25}{9}\right)^{\frac{-3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$

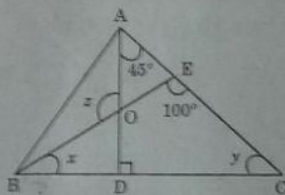
17. If both $(x - 2)$ and $\left(x - \frac{1}{2}\right)$ are factors of $px^2 + 5x + r$, show that $p = r$.

18. In the given figure, POQ is a straight line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2} [\angle QOS - \angle POS]$



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

20. In the given figure, $AD \perp BC$, $\angle BEC = 100^\circ$, $\angle DAC = 45^\circ$, find x , y and z .



21. If $x = 9 - 4\sqrt{5}$, find $x^2 + \frac{1}{x^2}$

22. Verify that $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2} (x + y + z) [(x - y)^2 + (y - z)^2 + (z - x)^2]$

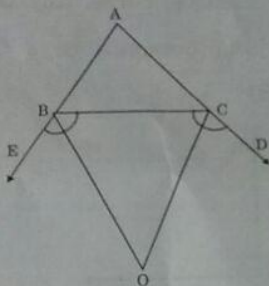
Section-D

23. If a transversal intersects two lines such that bisectors of pairs of corresponding angles are parallel, then prove that two lines are parallel.

24. Without actually calculating the cubes, find the value of $(1)^3 + (2)^3 + 2(4)^3 + (-5)^3 + (-6)^3$

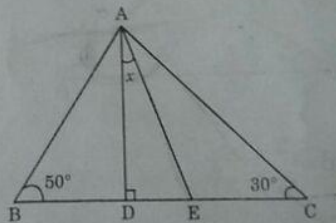
25. Simplify : $\frac{7\sqrt{3}}{\sqrt{10 + \sqrt{3}}} - \frac{2\sqrt{5}}{\sqrt{6 + \sqrt{5}}} - \frac{3\sqrt{2}}{\sqrt{15 + 3\sqrt{2}}}$

26. In the given figure, sides AB and AC of $\triangle ABC$ are produced to points E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at point O, then prove that $\angle BOC = 90^\circ - \frac{1}{2} \angle BAC$



27. Asha and Raju contributed equal amount towards Prime Minister's relief fund. Raju and Rahul contributed equal amount towards Prime Minister's relief fund. If Rahul contributed ₹ 500, how much did Asha contributed? Which Euclid axiom helped you in reaching the correct answer? What value they are exhibiting by doing so? State one Euclid's postulate.

28. In the given figure, find x if AE is bisector of $\angle BAC$ of $\triangle ABC$ and AD is perpendicular to BC.



29. Find the value of a and b if $\frac{\sqrt{7} - 1}{\sqrt{7} + 1} - \frac{\sqrt{7} + 1}{\sqrt{7} - 1} = a + b\sqrt{7}$

30. If A and B are remainders when $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$ are divided by $(x + 1)$ and $(x - 2)$ respectively and $2A + B = 6$, find a .

