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SAMPLE PAPER 02 FOR PERIODIC TEST 02 (2025-26)
(Quadratic Equations, AP, Triangles and Coordinate Geometry)

SUBJECT: MATHEMATICS   **MAX. MARKS : 40**

**CLASS : X**   **DURATION : 1½ hrs**

General Instructions:
(i).   **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v).   **Use of Calculators is not permitted**

<u>SECTION – A</u>
Questions 1 to 10 carry 1 mark each.

1. The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is
   (a) 5   (b) 12   (c) 11   (d) $7 + \sqrt{5}$

2. The value(s) of k for which the quadratic equation $2x^2 + kx + 2 = 0$ has equal roots, is
   (a) 4   (b) ± 4   (c) – 4   (d) 0

3. In given figure, AD = 3 cm, AE = 5 cm, BD = 4 cm, CE = 4 cm, CF = 2 cm, BF = 2.5 cm, then
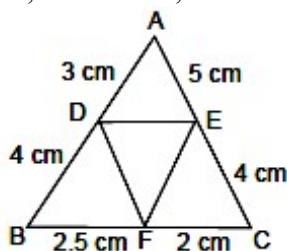
   (a) DE ‖ BC   (b) DF ‖ AC   (c) EF ‖ AB   (d) none of these

4. If (1 – p) is a root of the equation $x^2 + px + 1 – p = 0$, then roots are
   (a) 0, 1   (b) – 1, 1   (c) 0, – 1   (d) – 1, 2

5. If $k, 2k – 1$ and $2k + 1$ are three consecutive terms of an A.P., then the value of k is:
   (a) 2   (b) 3   (c) –3   (d) 5

6. Points A(–1, y) and B(5, 7) lie on a circle with centre O(2, –3y). The values of y are
   (a) 1, –7   (b) –1, 7   (c) 2, 7   (d) –2, –7

7. The common difference of an A.P., whose nth term is $a_n = (3n + 7)$, is:
   (a) 3   (b) 7   (c) 10   (d) 6

8. If $\triangle ABC \sim \triangle EDF$ and $\triangle ABC$ is not similar to $\triangle DEF$, then which of the following is not true?
   (a) BC . EF = AC . FD
   (b) AB . EF = AC . DE
   (c) BC . DE = AB . EF
   (d) BC . DE = AB . FD

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

9. **Assertion (A) :** The equation $x^2 + 3x + 1 = (x - 2)^2$ is a quadratic equation.
   Reason (R) : Any equation of the form $ax^2 + bx + c = 0$ where $a \neq 0$, is called a quadratic equation.

10. **Assertion (A):** If the second term of an A.P., is 13 and the fifth term is 25, then its 7th term is 33.
    Reason (R): If the common difference of an A.P. is 5, then $a_{18} - a_{13}$ is 25.
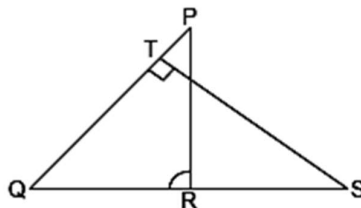
SECTION – B
Questions 11 to 14 carry 2 marks each.

11. Find the point on y-axis which is equidistant from the points $(5, -2)$ and $(-3, 2)$.

12. Find the value of α such that the quadratic equation $(\alpha - 12)x^2 + 2(\alpha - 12)x + 2 = 0$, has equal roots.

13. In the figure, PQR and QST are two right triangles, right angled at R and T respectively. Prove that $QR \times QS = QP \times QT$

14. The sum of the squares of three consecutive positive integers is 50. Find the integers.
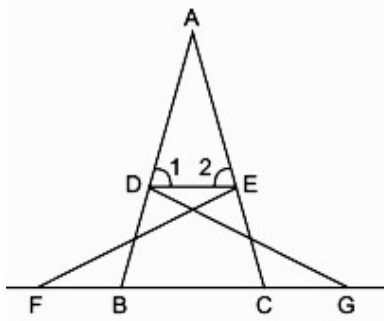
SECTION – C
Questions 15 to 17 carry 3 marks each.

15. Solve the following for x : $\dfrac{1}{2a+b+2x} = \dfrac{1}{2a} + \dfrac{1}{b} + \dfrac{1}{2x}$

16. The first term of an A.P. is –5 and the last term is 45. If the sum of the terms of the A.P. is 120, then find the number of terms and the common difference.
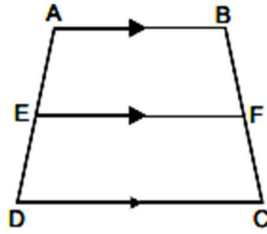
17. In figure, $\Delta FEC \cong \Delta GBD$ and $\angle 1 = \angle 2$. Prove that $\Delta ADE \sim \Delta ABC$.

18. If a line is drawn parallel to one side of a triangle, the other two sides are divided in the same ratio, prove it. Use this result to prove the following :

In the given figure, if ABCD is a trapezium in which AB || DC || EF, then $\dfrac{AE}{ED} = \dfrac{BF}{FC}$


SECTION – E (Case Study Based Questions)
Questions 19 to 20 carry 4 marks each.

19. Manpreet Kaur is the national record holder for women in the shot-put discipline. Her throw of 18.86 m at the Asian Grand Prix in 2017 is the maximum distance for an Indian female athlete. Keeping her as a role model, Sanjitha is determined to earn gold in Olympics one day. Initially her throw reached 7.56 m only. Being an athlete in school, she regularly practiced both in the mornings and in the evenings and was able to improve the distance by 9 cm every week.
During the special camp for 15 days, she started with 40 throws and every day kept increasing the number of throws by 12 to achieve this remarkable progress.

(a) How many throws Sanjitha practiced on 11th day of the camp?
(b) What would be Sanjitha's throw distance at the end of 6 weeks?
OR
(b) When will she be able to achieve a throw of 11.16 m?
(c) How many throws did she do during the entire camp of 15 days?

20. In order to conduct sports day activities in your school, lines have been drawn with chalk powder at a distance of 1 m each in a rectangular shaped ground ABCD. 100 flower pots have been placed at the distance of 1 m from each other along AD, as shown in the following figure. Niharika runs ($\dfrac{1}{4}$)th distance AD on the 2nd line and posts a green Flag. Preet runs ($\dfrac{1}{5}$) th distance AD on the eighth line and posts are red flags. Taking A as the origin AB along x-axis and AD along y-axis, answer the following questions:
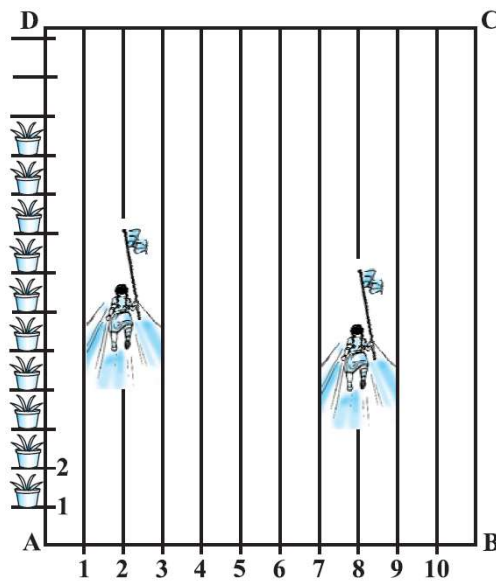
(i) Find the coordinates of the green flag. (1)

(ii) Find the distance between the two flags. (1)

(iii) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag? (2)

OR

(iii) If Joy has to post a flag at one fourth distance from the green flag, in the line segment joining the green and red flags, then where should he post his flag? (2)