Class X Mathematics — Practice Paper 1

Practice paper in the CBSE section pattern · Time: 1 hour · Maximum marks: 30

General instructions

1. This is an original practice paper, shorter than a board paper. It is not an official CBSE sample paper; official sample papers are published at cbseacademic.nic.in.
2. All questions are compulsory. Marks are shown in brackets.
3. Section A has 1-mark questions, Section B 2-mark, Section C 3-mark, Section D a 5-mark question and Section E a case-based question.
4. Write neatly, show your working and check your answers in the last five minutes.

Section A (6 marks)

Multiple choice and assertion–reason. 1 mark each.

1. The HCF of 36 and 84 is: [1]
   (a) 6
   (b) 12
   (c) 18
   (d) 24

2. If 2 is a zero of $x^2 - 5x + k$, then k is: [1]
   (a) 4
   (b) 6
   (c) −6
   (d) 10

3. The distance between (2, 3) and (5, 7) is: [1]
   (a) 3
   (b) 4
   (c) 5
   (d) 7

4. $\sin 30° + \cos 60°$ equals: [1]
   (a) 0
   (b) 1/2
   (c) 1
   (d) $\sqrt{3}$

5. A fair die is thrown once. The probability of getting a prime number is: [1]
   (a) 1/6
   (b) 1/3
   (c) 1/2
   (d) 2/3

6. Assertion (A): $7 \times 11 \times 13 + 13$ is a composite number. [1]
   Reason (R): A number with a factor other than 1 and itself is composite.
   (a) Both true, R explains A
   (b) Both true, R does not explain A
   (c) A true, R false
   (d) A false, R true

Section B (6 marks)

Very short answers. 2 marks each.

7. Solve: $x + y = 7$ and $x - y = 3$. [2]

8. Find the 10th term of the AP 3, 7, 11, … [2]

9. In triangle ABC, DE ∥ BC with D on AB and E on AC. AD = 2 cm, DB = 3 cm, AE = 3 cm. Find EC. [2]

Section C (9 marks)

Short answers. 3 marks each.

10. Find the roots of $2x^2 - 7x + 3 = 0$ by factorisation. [3]

11. Find the sum of the first 20 terms of the AP 5, 9, 13, … [3]

12. Prove that $(1 - \cos^2\theta)(1 + \cot^2\theta) = 1$. [3]

Section D (5 marks)

Long answer. 5 marks.

13. A toy is a cone of radius 3.5 cm and height 12 cm standing on a hemisphere of the same radius. Find the volume of the toy. (Take $\pi = 22/7$.) [5]

Section E (4 marks)

Case-based question. 4 marks.

14. A kite is flying on a string 60 m long that makes an angle of 60° with the level ground (assume the string is straight). [4]
    (i) Find the height of the kite. (2)
    (ii) If the angle becomes 30° with the same string, find the new height. (1)
    (iii) By how much has the kite come down? (1)

Answer key and marking guide

Award marks for each correct step shown in brackets. Accept any correct method or equivalent wording; value points are a guide, not a script.

Section A

Q	Answer	Marking
1	(b) 12	$36 = 2^2 \times 3^2$, $84 = 2^2 \times 3 \times 7$, so HCF $= 2^2 \times 3 = 12$.
2	(b) 6	$4 - 10 + k = 0$ gives $k = 6$.
3	(c) 5	$\sqrt{(3^2 + 4^2)} = 5$.
4	(c) 1	$1/2 + 1/2 = 1$.
5	(c) 1/2	Primes 2, 3, 5: 3 out of 6.
6	(a)	$7 \times 11 \times 13 + 13 = 13 \times 78$, so 13 is a factor; R is the definition used.

Section B

Q	Answer	Marking
7	$x = 5$, $y = 2$	Adding gives $2x = 10$ (1 mark); $x = 5$, $y = 2$ (1 mark).
8	39	$a = 3$, $d = 4$ (½ + ½); $a_{10} = 3 + 9 \times 4 = 39$ (1).
9	EC = 4.5 cm	AD/DB = AE/EC by the Basic Proportionality Theorem (1); 2/3 = 3/EC, EC = 4.5 cm (1).

Section C

Q	Answer	Marking
10	$x = 1/2$ or $x = 3$	Splitting $-7x$ as $-6x - x$ (1); $(2x - 1)(x - 3) = 0$ (1); both roots (1).
11	860	Formula $S = n/2[2a + (n - 1)d]$ (1); substitution $10[10 + 76]$ (1); 860 (1).
12	Proof	$1 - \cos^2\theta = \sin^2\theta$ (1); $1 + \cot^2\theta = \operatorname{cosec}^2\theta$ (1); $\sin^2\theta \times \operatorname{cosec}^2\theta = 1$ (1).

Section D

Q	Answer	Marking
13	≈ 243.83 cm³	Cone volume $\frac{1}{3}\pi r^2 h = 154$ cm³ (2); hemisphere $\frac{2}{3}\pi r^3 \approx 89.83$ cm³ (2); total ≈ 243.83 cm³ (1).

Section E

Q	Answer	Marking
14	(i) $30\sqrt{3} \approx 51.96$ m (ii) 30 m (iii) ≈ 21.96 m	(i) $h = 60 \sin 60°$ (1), $= 30\sqrt{3}$ m (1). (ii) $60 \sin 30° = 30$ m (1). (iii) $51.96 - 30 \approx 21.96$ m (1).

Marking guide in brief

- Step marks: a correct method with a slip in arithmetic keeps most of the marks.
- Units, labels and a final statement are part of the answer.
- In long answers, marks go to the points made, not the length.

- Time check: about 1 minute per mark leaves time to revise.