Baselios Public School

Undera, Vadodara

Pre-Board Examination - ANSWER KEY

Standard: Class 10 | Subject: Mathematics - Basic | Max Marks: 80

Section A

1. HCF of 72,120: [1 marks]

A) 6 B) 12 **C) 24 ✓** D) 36

Answer:
24

2. If a graph cuts x-axis at two points, polynomial degree is likely: [1 marks]

A) 0 B) 1 **C) 2 ✓** D) 3

Answer:
2

3. Coincident lines have: [1 marks]

A) unique solution **B) infinite solutions ✓** C) no solution D) inconsistent

Answer:
infinite solutions

4. AP 3,6,9... sequence type [1 marks]

A) GP **B) AP ✓** C) HP D) none

Answer:
AP

5. The discriminant for $2x^2+5x+3=0$: [1 marks]

A) 25-24 ✓ B) 25+24 C) 24-25 D) 0

Answer:
25-24

6. Equation 2x + y = 4 and x - y = 1 solved gives: [1 marks]

A) (1,2) ✓ B) (2,0) C) (1,1) D) (2,2)

Answer:
(1,2)

7. Which point lies on the negative y-axis? [1 marks]

A) (0, 5) B) (−5, 0) **C) (0, −6) ✓** D) (−4, −3)

Answer:
(0, −6)

8. The tangent drawn at any point on a circle makes an angle with the chord equal to: [1 marks]

A) Angle in opposite arc ✓ B) 90°
C) 45° D) 0°

Answer:
Angle in opposite arc

9. If a line intersects a circle at exactly two points, it is a: [1 marks]

A) Tangent B) Chord **C) Secant ✓** D) Radius

Answer:
Secant

10. Which triangles have equal shape and size? [1 marks]

A) Similar **B) Congruent ✓** C) Right D) Scalene

Answer:
Congruent

11. A tangent is a special case of: [1 marks]

A) Chord B) Radius C) Diameter **D) Secant ✓**

Answer:
Secant

12. The angle of elevation of a tower is 60°. Which ratio gives the height? [1 marks]

A) sin 60° B) cos 60° **C) tan 60° ✓** D) sec 60°

Answer:
tan 60°

13. Which of the following ratios has the maximum value? [1 marks]

A) sin 60° B) cos 30° C) tan 45° **D) sec 60° ✓**

Answer:
sec 60°

14. Which ratio has value $\sqrt{3}$ at θ = 60°? [1 marks]

A) sin B) cos **C) tan ✓** D) cosec

Answer:
tan

15. The total surface area of a cylinder includes: [1 marks]

A) curved surface only B) bases only
C) curved surface and bases ✓ D) none

Answer:
curved surface and bases

16. If the edge of a cube is halved, its volume becomes: [1 marks]

A) half B) one-fourth **C) one-eighth ✓** D) double

Answer:
one-eighth

17. Cumulative frequency is obtained by: [1 marks]

A) subtracting frequencies B) multiplying frequencies
C) adding frequencies ✓ D) dividing frequencies

Answer:
adding frequencies

18. Which measure is best for open-end classes? [1 marks]

A) mean | **B) median ✓** | C) mode | D) range

Answer:
median

19. Assertion (A): The slant height of a cone can be equal to its height.

Reason (R): Slant height is always greater than height in a cone.
[1 marks]

A) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
B) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.
C) Assertion is correct but Reason is incorrect.
D) Assertion is incorrect but Reason is correct. ✓

Answer:
Assertion is incorrect but Reason is correct.

20. Assertion (A): If two triangles have equal areas, they must be similar.

Reason (R): Equal areas imply proportional sides.
[1 marks]

A) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
B) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.
C) Assertion is correct but Reason is incorrect.
D) Assertion is incorrect but Reason is correct. ✓

Answer:
Assertion is incorrect but Reason is correct.

Section B

1. AP has difference -3. Is it increasing or decreasing? [2 marks]

Answer:
Decreasing

2. Using substitution, solve $x = 5 - y$ and $2x + y = 7$. [2 marks]

Answer:
Substitute → 2(5 - y) + y = 7 →10 - 2y + y = 7 →y = 3→x = 2.

OR

Find decimal type of 5/6. [2 marks]

OR Answer:
Non-terminating repeating

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3. How many zeroes can a quadratic polynomial have? [2 marks]

Answer:
Maximum two zeroes.

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4. Find decimal type of 5/6. [2 marks]

Answer:
Non-terminating repeating

OR

Solve x−2y = 1 and 2x + 3y = 12. [2 marks]

OR Answer:
Multiply first by 2 → elimination yields x = 3,y = 1.

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5. Prove that similar triangles have proportional corresponding sides. [2 marks]

Answer:
Corresponding sides are proportional.

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6. Why is tan 90° not defined? [2 marks]

Answer:
tan 90° is not defined

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7. What is the probability of getting a number less than 7 on a die? [2 marks]

Answer:
1

Section C

1. Solve $2x^2 + x - 6 = 0$. [3 marks]

> **Answer:**
> $x = [-1 \pm \sqrt{49}]/4 \rightarrow x = 3/2, -2$.

2. A sequence has constant difference. Is it AP? [3 marks]

> **Answer:**
> Yes, definition of AP.

3. Solve $x^2 - 4x - 21 = 0$. [3 marks]

> **Answer:**
> $x = 7, -3$.

OR

Check decimals of 7/25. [3 marks]

> **OR Answer:**
> Denominator 25 ⇒ terminating = 0.28.

4. Why is a tangent always a straight line? [3 marks]

> **Answer:**
> Definition of tangent

5. Check decimals of 7/25. [3 marks]

> **Answer:**
> Denominator 25 ⇒ terminating = 0.28.

OR

Find t50 of AP 2,6,10,... [3 marks]

> **OR Answer:**
> t50=2+49×4=198

6. Prove that the distance between the centre of a circle and a tangent is equal to the radius. [3 marks]

> **Answer:**
> Perpendicular distance = radius

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7. Prove that tan 45° = 1. [3 marks]

> **Answer:**
> tan 45° = 1

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8. What is experimental probability? [3 marks]

> **Answer:**
> Probability based on trials.

Section D

1. Prove that two right triangles with equal acute angles are similar. [5 marks]

> **Answer:**
> Equal acute angles imply similarity.

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2. Find the mode of the following data. Class intervals: 0–10, 10–20, 20–30, 30–40 Frequencies: 3, 7, 15, 5 [5 marks]

> **Answer:**
> Mode = 23.

OR

From the top of a building, the angles of depression of the top and bottom of a tower are observed to be 30° and 45° respectively. If the tower is 10 m high, find the height of the building. [5 marks]

> **OR Answer:**
> Height = $10(\sqrt{3} + 1)$ m

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3. Explain why two tangents drawn from an external point are symmetric. [5 marks]

> **Answer:**
> Congruent right triangles

4. From the top of a building, the angles of depression of the top and bottom of a tower are observed to be 30° and 45° respectively. If the tower is 10 m high, find the height of the building. [5 marks]

> **Answer:**
> Height = $10(\sqrt{3} + 1)$ m

OR

Prove that the lengths of tangents drawn from an external point to a circle are equal. [5 marks]

> **OR Answer:**
> Tangents from an external point are equal

5. Prove that sin 45° = cos 45°. [5 marks]

> **Answer:**
> sin 45° = cos 45°

6. Find the probability of drawing a face card from a deck of 52 cards. [5 marks]

> **Answer:**
> Probability = 3/13.

Section E

1. Revenue model R=x(20-x) for selling x products. [4 marks]

> **Answer:**
> Answer not available

Sub-questions:

(a) Find max revenue using quadratic. [2 marks]

Ans: Max at vertex = 100

(b) When max occurs? [2 marks]

Ans: x = 10

2. AP model for parking slots increases by 3 per level starting 50. [4 marks]

> **Answer:**

Answer not available

Sub-questions:

(a) Find slots in 20th level. [2 marks]

Ans: 50 + 19×3 = 107

(b) Total slots in first 20 floors. [2 marks]

Ans: S20 = 10(100 + 57) = 1570

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3. A boy collects coins increasing pattern: 2, 5, 8, 11, ... [4 marks]

Answer:
Answer not available

Sub-questions:

(a) Coins collected on 25th day? [2 marks]

Ans: 2 + 24×3 = 74

(b) Total collected in 25 days? [2 marks]

Ans: S25 = 25/2(4 + 72) = 950

*** End of Answer Key ***