

ICSE Class 10 Mathematics 2026 Question Paper with Solutions

Time Allowed :2 Hours	Maximum Marks :100	Total Questions :9
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General Instructions

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will not be allowed to write during the first 15 minutes.*
3. *This time is to be spent in reading the question paper.*
4. ***The time given at the head of this Paper is the time allowed for writing the answers.***
5. *Attempt all questions from **Section A** and any four questions from **Section B**.*
6. *The intended marks for questions or parts of questions are given in brackets[].*

1. A retailer buys a TV from a wholesaler for 20,000 and sells it to a consumer at a 10% profit. If the GST rate is 18%, calculate the total tax paid by the retailer to the Government.

- (A) 3,600
(B) 3,960
(C) 360
(D) 2,000

Correct Answer: (C) 360

Solution:

Step 1: Understanding the Concept:

The GST paid by a retailer to the government is the difference between the tax collected from the consumer (Output GST) and the tax paid to the wholesaler (Input Tax Credit or ITC).

Alternatively, since the retailer pays tax on the value added, the tax paid to the government is simply the GST percentage applied to the profit made.

Step 2: Key Formula or Approach:

Method 1: Tax to Govt = Output GST – Input Tax Credit (ITC)

Method 2: Tax to Govt = GST% of Profit

Step 3: Detailed Explanation:

Cost Price (CP) for the retailer = 20,000

Input GST (ITC) = 18% of 20,000

$$ITC = \frac{18}{100} \times 20,000 = 3,600$$

Profit percentage = 10%

Profit amount = 10% of 20,000 = 2,000

Selling Price (SP) to consumer = CP + Profit = 20,000 + 2,000 = 22,000

Output GST collected from consumer = 18% of 22,000

$$\text{Output GST} = \frac{18}{100} \times 22,000 = 3,960$$

Total tax paid by the retailer to the Government = Output GST – Input GST

$$\text{Tax paid} = 3,960 - 3,600 = 360$$

Using the alternative method:

Profit = 2,000

Tax on profit = 18% of 2,000 = 360

Step 4: Final Answer:

The total tax paid by the retailer to the Government is 360.

💡 Quick Tip

In GST problems, the tax paid by any middleman (retailer) to the government is always the tax on the "value added" (profit).

Tax Paid = GST% $\times$ Profit. This saves calculation time!

2. Find the value of k if $(x - 3)$ is a factor of the polynomial $x^3 - kx^2 + 15x - 6$.

- (A) $k = 5$
- (B) $k = \frac{22}{3}$
- (C) $k = 7$
- (D) $k = 8$

Correct Answer: (B) $k = \frac{22}{3}$

Solution:

Step 1: Understanding the Concept:

According to the Factor Theorem, if $(x - a)$ is a factor of a polynomial $f(x)$, then the remainder $f(a)$ must be zero.

Step 2: Key Formula or Approach:

Let $f(x) = x^3 - kx^2 + 15x - 6$.

Since $(x - 3)$ is a factor, equate $f(3) = 0$.

Step 3: Detailed Explanation:

Substitute $x = 3$ into the polynomial:

$$f(3) = (3)^3 - k(3)^2 + 15(3) - 6$$

Equating to zero because it is a factor:

$$27 - 9k + 45 - 6 = 0$$

Combine the constant terms:

$$27 + 45 - 6 = 66$$

So the equation becomes:

$$66 - 9k = 0$$

$$9k = 66$$

$$k = \frac{66}{9}$$

Simplifying the fraction by dividing numerator and denominator by 3:

$$k = \frac{22}{3}$$

Step 4: Final Answer:

The value of k is $\frac{22}{3}$ or approximately 7.33.

💡 Quick Tip

Always perform the substitution carefully. If $(x - a)$ is a factor, plug in a . If $(x + a)$ is a factor, plug in $-a$.

Double check simple arithmetic like $27 + 45 - 6$ to avoid silly errors.

3. Solve the quadratic equation $x^2 - 5x - 10 = 0$ and give your answer correct to two decimal places.

- (A) 6.53, -1.53
- (B) 5.53, -0.53
- (C) 6.35, -1.35
- (D) 7.12, -2.12

Correct Answer: (A) 6.53, -1.53

Solution:

Step 1: Understanding the Concept:

When a quadratic equation cannot be easily factored by splitting the middle term, we use the quadratic formula.

Step 2: Key Formula or Approach:

For $ax^2 + bx + c = 0$, the roots are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Step 3: Detailed Explanation:

Identify coefficients from $x^2 - 5x - 10 = 0$:

$a = 1$, $b = -5$, $c = -10$.

First, calculate the discriminant D :

$$D = b^2 - 4ac = (-5)^2 - 4(1)(-10)$$

$$D = 25 + 40 = 65$$

Now substitute into the formula:

$$x = \frac{-(-5) \pm \sqrt{65}}{2(1)}$$

$$x = \frac{5 \pm \sqrt{65}}{2}$$

We need the value of $\sqrt{65}$. Since $8^2 = 64$, $\sqrt{65} \approx 8.062$.

Case 1: $x = \frac{5+8.062}{2} = \frac{13.062}{2} = 6.531$

Case 2: $x = \frac{5-8.062}{2} = \frac{-3.062}{2} = -1.531$

Rounding to two decimal places, we get $x = 6.53$ and $x = -1.53$.

Step 4: Final Answer:

The solutions are 6.53 and -1.53.

💡 Quick Tip

For exams, memorize common square roots or know how to estimate them. $\sqrt{65}$ is just slightly more than $\sqrt{64} = 8$.

Always re-read the precision requirement (e.g., "two decimal places").

4. In a circle, two chords AB and CD intersect internally at P . If $AP = 4$ cm, $PB = 6$ cm, and $CP = 3$ cm, find the length of PD .

- (A) 4 cm
- (B) 6 cm
- (C) 8 cm
- (D) 12 cm

Correct Answer: (C) 8 cm

Solution:

Step 1: Understanding the Concept:

The intersecting chords theorem states that if two chords of a circle intersect at an internal point, the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord.

Step 2: Key Formula or Approach:

If chords AB and CD intersect at P , then:

$$AP \times PB = CP \times PD$$

Step 3: Detailed Explanation:

Given values:

$$AP = 4 \text{ cm}$$

$$PB = 6 \text{ cm}$$

$$CP = 3 \text{ cm}$$

Substitute these into the formula:

$$4 \times 6 = 3 \times PD$$

$$24 = 3 \times PD$$

Isolate PD :

$$PD = \frac{24}{3}$$

$$PD = 8 \text{ cm}$$

Step 4: Final Answer:

The length of PD is 8 cm.

💡 Quick Tip

Remember: Segment product property holds true whether the chords intersect internally or externally (though the segment definitions change slightly for external). For internal intersection, it's just the two parts of each line segment.

5. From the top of a 100 m high cliff, the angle of depression of a boat is 45° . Calculate the distance of the boat from the foot of the cliff.

- (A) 50 m
- (B) 100 m
- (C) $100\sqrt{3}$ m
- (D) 200 m

Correct Answer: (B) 100 m

Solution:

Step 1: Understanding the Concept:

The angle of depression from the top of the cliff is equal to the angle of elevation from the boat at the foot level (alternate interior angles). This creates a right-angled triangle.

Step 2: Key Formula or Approach:

In right-angled triangle ABC , where AB is the height and BC is the distance:

$$\tan(\theta) = \frac{\text{Perpendicular}}{\text{Base}} = \frac{\text{Height of cliff}}{\text{Distance from foot}}$$

Step 3: Detailed Explanation:

Let the height of the cliff $AB = 100$ m.

Let the distance of the boat from the foot of the cliff be d .

The angle of depression = 45° , so angle of elevation $\theta = 45^\circ$.

Using the tangent ratio:

$$\tan(45^\circ) = \frac{100}{d}$$

We know that $\tan(45^\circ) = 1$.

$$1 = \frac{100}{d}$$

$$d = 100 \text{ m}$$

Step 4: Final Answer:

The distance of the boat from the foot of the cliff is 100 m.

💡 Quick Tip

Whenever the angle of elevation or depression is 45° , the triangle is an isosceles right triangle. This means the height and the distance (base) are always equal! No calculation is needed.

6. A bag contains 5 red, 8 white, and 7 black balls. A ball is drawn at random. Find the probability that the ball drawn is neither red nor black.

- (A) $\frac{1}{4}$
- (B) $\frac{2}{5}$
- (C) $\frac{3}{11}$
- (D) $\frac{7}{20}$

Correct Answer: (B) $\frac{2}{5}$

Solution:

Step 1: Understanding the Concept:

Probability of an event is the ratio of the number of favorable outcomes to the total number of possible outcomes.

Step 2: Key Formula or Approach:

$$P(E) = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$

Step 3: Detailed Explanation:

First, calculate the total number of balls in the bag:

Total balls = 5 (red) + 8 (white) + 7 (black) = 20

The condition "neither red nor black" means the ball must be white.

Number of white balls (favorable outcomes) = 8

Probability $P(\text{neither red nor black}) = \frac{8}{20}$

Simplify the fraction by dividing both numerator and denominator by 4:

$$P = \frac{8 \div 4}{20 \div 4} = \frac{2}{5}$$

Step 4: Final Answer:

The probability that the ball drawn is neither red nor black is $\frac{2}{5}$ (or 0.4).

💡 Quick Tip

"Neither A nor B" is logically equivalent to saying "Not (A or B)". In this specific case with three mutually exclusive categories, it simply points to the remaining category (White).