BCM SCHOOL, BASANT AVENUE, DUGRI, LUDHIANA.
SEPTEMBER ASSIGNEMENT- 2025-26
CLASS- X (MATHEMATICS)

ANSWER KEY

SECTION –A (MULTIPLE CHOICE QUESTIONS)

1.	D
2.	B
3.	D
4.	B

SECTION B(2 MARKS QUESTIONS)

5. HCF(720 & 405) = 45
No. of glasses from first vessel = 720/45 = 16
No. of glasses from second vessel = 405/45 = 9
Total glasses = 25

6.
- (A) The probability that the card drawn is neither a king nor queen is $\frac{44}{52} = \frac{11}{13}$.
- (B) The probability that the card drawn is a non-face card of red color is $\frac{20}{52} = \frac{5}{13}$.
- (C) The probability that the card drawn is a card of spade or an ace is $\frac{16}{52} = \frac{4}{13}$.
- (D) The probability that the card drawn is a card of clubs is $\frac{13}{52} = \frac{1}{4}$.
- (E) The probability that the card drawn is the 10 of hearts is $\frac{1}{52}$.

SECTION – C (3 MARKS QUESTIONS)

7 The series which is a multiple of 2 is 2, 4, 5,........,500
N= 250, S_{250} = 62,750
The series which is a multiple of 5 is 5, 10, 15,........,500
N= 100, S_{100} = 25,250
The series is 10, 20, 30,........500
N= 50, S_{50} = 12,750
Now, sum of the integers which is a multiple of 2 or 5 is sum of multiples of 2 + sum of multiples of 5 - sum of multiples of 2 as well as of 5
= S_{250} + S_{100} - S_{50}
= 62750 + 25250 - 12750
= 88000 - 12750
= 75250

8. $AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Substituting the coordinates:

$$AB = \sqrt{(3-0)^2 + (\sqrt{3}-0)^2} = \sqrt{3^2 + (\sqrt{3})^2}$$
$$= \sqrt{9+3} = \sqrt{12} = 2\sqrt{3}$$

	1. For AC: $AC = \sqrt{(a-0)^2 + (b-0)^2} = 2\sqrt{3}$ Squaring both sides: $a^2 + b^2 = (2\sqrt{3})^2 = 12$ 2. For BC: $BC = \sqrt{(a-3)^2 + (b-\sqrt{3})^2} = 2\sqrt{3}$ Squaring both sides: $(a-3)^2 + (b-\sqrt{3})^2 = 12$ $(a-3)^2 + (b-\sqrt{3})^2 = 12$ $(a^2 - 6a + 9) + (b^2 - 2b\sqrt{3} + 3) = 12$ Substituting $a^2 + b^2 = 12$ into the equation: $12 - 6a + 9 + 3 - 12 = 0$ This simplifies to: $-6a + 0 = 0 \implies 6a = 0 \implies a = 0$ Substituting $a = 0$ into the first equation: $0^2 + b^2 = 12 \implies b^2 = 12 \implies b = \pm 2\sqrt{3}$ Thus, the third vertex C can be: 1. $C(0, 2\sqrt{3})$ 2. $C(0, -2\sqrt{3})$
9	$2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta)$ $= 2\sin^6\theta + 2\cos^6\theta - 3\sin^4\theta - 3\cos^4\theta$ $= (2\sin^6\theta - 3\sin^4\theta) + (2\cos^6\theta - 3\cos^4\theta)$ $= \sin^4\theta(2\sin^2\theta - 3) + \cos^4\theta(2\cos^2\theta - 3)$ $= \sin^4\theta\{2(1 - \cos^2\theta) - 3\} + \cos^4\theta\{2(1 - \sin^2\theta) - 3\}$ $= \sin^4\theta(2 - 2\cos^2\theta - 3) + \cos^4\theta(2 - 2\sin^2\theta - 3)$ $= \sin^4\theta(-1 - 2\cos^2\theta) + \cos^4\theta(-1 - 2\sin^2\theta)$ $= -\sin^4\theta - 2\sin^4\theta\cos^2\theta - \cos^4\theta - 2\cos^4\theta\sin^2\theta$

$= - \sin^4\theta - \cos^4\theta - 2\cos^4\theta\sin^2\theta - 2\sin^4\theta\cos^2\theta$

$= - \sin^4\theta - \cos^4\theta - 2\cos^2\theta\sin^2\theta(\cos^2\theta + \sin^2\theta)$

$= - \sin^4\theta - \cos^4\theta - 2\cos^2\theta\sin^2\theta(1)$

$= - \sin^4\theta - \cos^4\theta - 2\cos^2\theta\sin^2\theta$

$= - (\sin^4\theta + \cos^4\theta + 2\cos^2\theta\sin^2\theta)$

$= - \{(\sin^2\theta)^2 + (\cos^2\theta)^2 + 2\sin^2\theta\cos^2\theta\}$

$= - (\sin^2\theta + \cos^2\theta)^2$

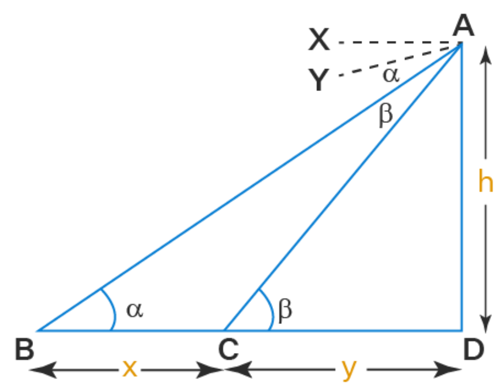
$= - (1)^2$

$= - 1$

$$2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = -1 + 1 = 0 = RHS$$

SECTION – D (5 MARKS QUESTIONS)

10. Let us consider,
BC = x
CD = y
By the properties of a triangle, we know that alternate angles of a triangle are equal.
So, ∠ABD = ∠BAX = α
∠ACD = ∠CAY = β.
Considering triangle ABD,we get
tanα = AD/BD
tanα = h/BC + CD
tanα = h/x+y
y = h/tanα - x -------------------(1)
Considering triangle ACD,we get
tanβ = AD/CD
tanβ = h/y
y = h/tanβ -----------------------(2)
Now, by comparing (1) and (2), we get,
h/tanα - x = h/tanβ
x = h/tanα - h/tanβ
x = h(1/tanα - 1/tanβ)
x = h(cotα - cotβ)
Therefore, the required distance is h(cotα - cotβ).



11. X=29, y =1

12. Let the consecutive numbers in AP be a - 3d, a - d, a + d, a + 3d.
So, a - 3d + a - d + a + d + a + 3d = 32
4a = 32
a = 32/4
a = 8
Product of the first and last terms = (a - 3d)(a + 3d)
Put a = 8,
= (8 - 3d)(8 + 3d)
= 64 - $9d^2$
Product of the two middle terms = (a - d)(a + d) = (a^2 - d^2)

	Put a = 8, = 64 - d^2 $(64 - 9d^2)/(64 - d^2) = 7/15$ $15(64 - 9d^2) = 7(64 - d^2)$ $15(64) - 135d^2 = 7(64) - 7d^2$ $15(64) - 7(64) = 135d^2 - 7d^2$ $64(15 - 7) = (135 - 7)d^2$ $64(8) = 128d^2$ $d^2 = 64(8)/128$ $d^2 = 8/2$ $d^2 = 4$ Taking square root, d = ±2 Take d = 2, When a = 8 and d = 2, The four consecutive numbers are a - 3d = 8 - 3(2) = 8 - 6 = 2 a - d = 8 - 2 = 6 a + d = 8 + 2 = 10 a + 3d = 8 + 3(2) = 8 + 6 = 14 Therefore, the four consecutive terms of the AP are 2, 6, 10, 14.
	SECTION – E (CASE STUDY)
13.	(A) $2x(x-10) = x^2 + 300.$ (B)the number of rows in the original arrangement is 30 (C) The total number of seats in the original arrangement is 900 OR the total number of seats after re-arrangement is 900+300 = 1200
14.	(A) 138 (B) 150 (C) 2160 OR n= 7