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

SECTION –A (MULTIPLE CHOICE QUESTIONS)

1.	a
2.	c
3.	b
4.	d

SECTION B(2 MARKS QUESTIONS)

5. Mode = 65.625

6. Let P(x,y), Q(a+b,b-a) and R(a-b,a+b) be the given points. Then,PQ=PR

$$\Rightarrow \sqrt{\{x-(a+b)\}^2+\{y-(b-a)\}^2} = \sqrt{\{x-(a-b)\}^2+\{y-(a+b)\}^2}$$

$$\Rightarrow \{x-(a+b)\}^2+\{y-(b-a)\}^2 = \{x-(a-b)\}^2+\{y-(a+b)\}^2$$

$$\Rightarrow x^2-2x(a+b)+(a+b)^2+y^2-2y(b-a)+(b-a)^2$$

$$= x^2+(a-b)^2-2x(a-b)+y^2-2y(a+b)+(a+b)^2$$

$$\Rightarrow -2x(a+b)-2y(b-a) = -2x(a-b)-2y(a+b)$$

$$\Rightarrow ax+bx+by-ay = ax-bx+ay+by$$

$$\Rightarrow 2bx = 2ay \Rightarrow bx = ay$$

7.
(A) 44/52 = 11/13
(B) 20/52 = 5/13.
(C) 16/52 = 4/13.
(D) 13/52 = 1/4
(E) 1/52.

SECTION – C (3 MARKS QUESTIONS)

8. In Δ OPQ, we have

$$OQ^2 = OP^2 + PQ^2$$

$$\Rightarrow (PQ+1)^2 = OP^2 + PQ^2 \; [\because OQ - PQ = 1 \Rightarrow OQ = 1 + PQ]$$

$$\Rightarrow PQ^2 + 2PQ + 1 = OP^2 + PQ^2$$

$$\Rightarrow 2PQ + 1 = 49$$

$$\Rightarrow PQ = 24\,\text{cm}$$

$$\therefore OQ - PQ = 1\,\text{cm}$$

$$\Rightarrow OQ = (PQ+1)\text{cm} = 25\,\text{cm}$$

$$\text{Now, } \sin Q = \frac{OP}{OQ} = \frac{7}{25}$$

$$\text{and, } \cos Q = \frac{PQ}{OQ} = \frac{24}{25}$$

9. Distance between (0, 0) and (x, y) = Distance between (0, 0) and (3, √3) = Distance between (x, y) and (3, √3)

$\sqrt{(x^2 + y^2)} = \sqrt{(3^2 + 3)} = \sqrt{(x - 3)^2 + (y - \sqrt{3})^2}$

$x^2 + y^2 = 12$

$x^2 + 9 - 6x + y^2 + 3 - 2\sqrt{3}y = 12$

On solving , $x = \frac{6-\sqrt{3}\,y}{3}$ and $y = 2\sqrt{3} or -\sqrt{3}$

So,the third vertex of the equilateral triangle= $(0, 2\sqrt{3})$ or $(3, -\sqrt{3})$.

10. LHS $= 2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1$

$= 2\{(\sin^2\theta + \cos^2\theta)^3 - 3\sin^2\theta\cos^2\theta(\sin^2\theta + \cos^2\theta)\} - 3(\sin^2\theta + \cos^2\theta)^2$

We know, $[\sin^2 x + \cos^2 x = 1]$

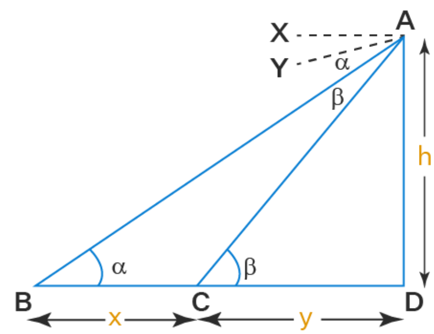
$= 2\{1 - 3\sin^2\theta\cos^2\theta\} - 3\{1 - 2\sin^2\theta\cos^2\theta\} + 1$

$= 2 - 6\sin^2\theta\cos^2\theta - 3 + 6\sin^2\theta\cos^2\theta + 1$

$= 0$

SECTION – D (5 MARKS QUESTIONS)

11. Considering triangle ABD,we get



$\tan\alpha = AD/BD$

$\tan\alpha = h/BC + CD$

$\tan\alpha = h/x+y$

$y = h/\tan\alpha - x$ -------------------(1)

Considering triangle ACD,we get

$\tan\beta = AD/CD$

$\tan\beta = h/y$

$y = h/\tan\beta$ ----------------------(2)

Now, by comparing (1) and (2), we get,

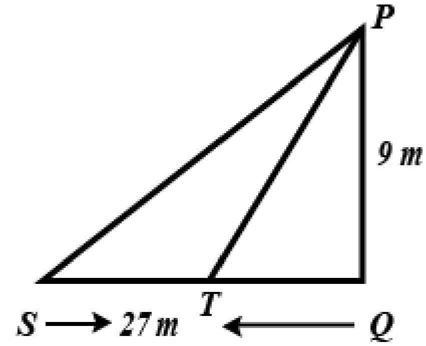
$h/\tan\alpha - x = h/\tan\beta$

$x = h/\tan\alpha - h/\tan\beta$

$x = h(1/\tan\alpha - 1/\tan\beta)$

$x = h(\cot\alpha - \cot\beta)$

Therefore, the required distance is $h(\cot\alpha - \cot\beta)$.

12.	$\therefore PT = ST = x$ Thus, in right triangle PQT, we have $QT = 27 - x, PT = x$ and $PQ = 9$ Using Pythagoras theorem, we have $PT^2 = PQ^2 + QT^2 \Rightarrow x^2 = 9^2 + (27 - x)^2$ $\Rightarrow x^2 = 81 + 729 - 54x + x^2 \Rightarrow 0 = 810 - 54x \Rightarrow 54x = 810 \Rightarrow x = 15$ $\therefore QT = SQ - ST = (27 - 15)m = 12m$ Hence the snake is caught at a distance of 12m from the hole. 
13.	Let the four consecutive numbers in AP be (a − 3d), (a − d), (a + d) and (a + 3d) So, according to the question. $a - 3d + a - d + a + d + a + 3d = 32$ On solving a = 8 Now, $(a - 3d)(a + 3d)/(a - d)(a + d) = 7/15$ $15(a^2 - 9d^2) = 7(a^2 - d^2)$ $15a^2 - 135d^2 = 7a^2 - 7d^2$ $15a^2 - 7a^2 = 135d^2 - 7d^2$ $8a^2 = 128d^2$ Putting the value of $a = 8$ in above we get. $8(8)^2 = 128d^2$ $128d^2 = 512$ $d^2 = 512/128$ $d^2 = 4$ **On solving,** $d = \pm 2$ Four consecutive numbers are 2, 6, 10and14
SECTION – E (CASE STUDY)	
14.	a) length = x , breadth = x-3 b) $x^2 - 9x + 14 = 0$ c) length = 7m and breadth = 4m OR Area of triangular part= $24\ m^2$
15.	a) 3900 b) 73500 c) 4900 OR 10:49