**CRITIRCAL AND CREATIVE THINKING ITEMS**

**CLASS X : CHAPTER 4 : QUADRATIC EQUATIONS**

**INDEX**

|  |  |
| --- | --- |
| **S.No.** | **Theme of the item** |
|  | Grass land with a flower bed |
|  | Throwing a ball |
|  | Window curtains |
|  | A trip by motor boat |
|  | A picnic by two cars |
|  | Combat of Bheeshm&Arjun |
|  | Peacock v/s snake |
|  | Rectangular pond |
|  | Picnic party |
|  | Seating arrangement in auditorium |
|  | Land donation |

TEST ITEM 11GRASS LANDWITH A FLOWERBED

Riya has a field with a flowerbed and grass land. The grass land is in the shape of rectangle while flowerbed is in the shape of square. The length of the grassland is found to be 3 m more than twice the length of the flowerbed. Total area of the whole land is 1260 m 2.



11.1 If the length of the square is x m then the total length of the field is

(a) (2x + 3) m (b) (3x + 3) m (c) (6x) m (d) ( x + 4) m 11.2 What will be the perimeter of the whole figure in terms of x?

(a) 8x + 6 (b) 6x +6 (c) 3x2+ 3x (d) 8x + 4

11.3 Find the value of x if the area of total field is 1260 m2.

11.4 Find area of grassland and the flowerbed separately.

11.5 Find theratio of area of grassland to area of flowerbed.

TEST ITEM 12 THROWING A BALL

Jackson throws a ball with a speed of 14 m/s whichfollows the curveh = - 5t2+ 14t + 3.

|  |  |
| --- | --- |
| quadratic graph ball | Where “h” represents height in meters and time “t” in seconds |

12.1 What is the height of the ball initially ?

(a) 12m (b) 13 m (c) 3m (d) - 3 m

12.2 What is the height of the ball after 3 sec.?

(a) 3m (b) 12 m (c) 13 m (d) 0 m

12.3 Find the possible values of ’t’ when the ball touches the ground.

12.4 Can the value of’ t’ be negative when the ball touches the ground?

12.5 Findthe maximum height attained by the ball.

TEST ITEM 13 WINDOW CURTAINS

Neelu wants to make the curtains for her window as shown in the figure. The window is in the shape of a rectangle, whose length and the breadth are in the ratio 2 : 3. If the area of the window is 864 square inches.



13.1 What is the shape of the window that is uncovered?

(a)Right triangle (b) Equilateral triangle. (c) Isosceles triangle (d) Rectangle

13.2 What will be the ratio of two sides of each curtain (other than hypotenuse) ?

(a) 1 : 3 (b) 2 : 3 (c) 1 : 1 (d) 3 : 2

13.3 Find the dimensions of the window.

13.4 How much window area is covered by the curtains?

13.5 What will be the perimeter of the window ?

TEST ITEM 14 A TRIP BY MOTOR BOAT

John and Priya went for a small picnic. After having their lunch Priya insisted to travel in a motor boat. The speed of the motor boat was 20 km/hr. Priya being a Mathematics student wanted to know the speed of the current. So she noted the time for upstream and downstream. She found that for covering the distance of 15 km the boat took 1 hour more for upstream than downstream.



14.1 Let speed of the stream be x km/hr. then speed of the motorboat in upstream will be

(a) 20 km/hr (b) (20 + x) km/hr (c) (20 – x ) km/hr (d) 2 km/hr

14.2 What is the relation between speed distance and time?

(a) speed = (b) distance = (c) time = speed x distance (d) none of these

14.3 Frame the quadratic equation and solve to find the speed of current.

14.4 On solving , you are getting two values, one positive and one negative. Why we can’t take the negative value?

TEST ITEM 15 A PICNIC BY TWO CARS

Nidhi and Ria are very close friends. Nidhi’s parents own a Toyota Liva. Ria’s parents own a Maruti Alto. Both the families decide to go for a picnic to Somnath temple in Gujrat by their own cars. Nidhi’s car travels x km/h while Ria’s car travels 5 km/h more than Nidhi’s car. Nidhi’s car uses 4 hrs more than Ria’s car in covering 400 km.



15.1In an hour ,If Nidhi’s car travels x km then what will be the distance covered by Ria’s car in an hour?

(a) (x + 5) km (b) (x -5 )km (c) x km (d) 5 km

15.Frame the quadratic equation and solve to find the speed of Nidhi's car?

15.3 Whether the coefficient of x2 and the constant term has opposite signs or not ? Is it helpful to conclude something about the nature of roots?

TEST ITEM 16 COMBAT OF BHEESHM & ARJUN

The angry Arjun carried some arrows for fighting with Bheeshm. With thehalf of the arrows, he cut down the arrows thrown by Bheeshm on him and with six other arrows, he killed the charioteer of Bheeshm.With one arrow each, he knocked down respectively the chariot, flag and the bow of Bheeshm. Finally, with one more than four times the square root of arrows, he laid Bheeshm unconscious on an arrow bed.



16.1 If Arjun had x arrows then by how many arrows he cut down arrows thrown by Bheeshm?

16.2. If Arjun had x arrows then by how many arrows he laid Bheeshm unconscious on arrow bed?

16.3 Frame and solve the quadratic equation.

16.4 The total number of arrows Arjun had

(a) 90 (b) 100 (c) 10 (d) 50

TEST ITEM 17 PEACOCK V/S SNAKE

A peacock is sitting on the top of a pillar which is 9m high. From a point 27m away from the bottom of the pillar, a snake is coming to its hole at the base of the pillar. Seeing the snake the peacock ounces on it. Their speeds are equaland the peacock catches the snake finally .

|  |  |
| --- | --- |
| ggg | C:\Users\lakhan\Desktop\c5bc1ee05087c448f6780943e58cdea8 - Copy.jpg |

17.1 Distance is equal to.

(a)Speed + time (b) speed X time (c) speed/time (d) time/speed

17.2 If ST =PT =(x)m ,Then what is distance TQ in terms of x ?

17.3 Form the equation and solve it.

17.4 At what distance from the hole is the snake caught?

TEST ITEM 18 RECTANGULAR POND

In a rectangular park of dimensions 50m X40m, a rectangular pond is constructed so that the green area strip of uniform width surrounding the pond will be 1184 m2

50 m

**POND**

40 m

18.1 What is the area of pond?

(a) 814 m 2 (b) 1184 m 2 (c) 816 m 2 (d) 2000 m 2

*18.2*If uniform width of strip is(x)m then find the dimensions of pond in terms of x.

18.3 Form and Solve the quadratic equation.

18.4 Find the length and breadth of pond?

TEST ITEM 19 PICNIC PARTY

Some students planned a picnic. The budget for picnic was Rs 2000 but 5 students failed to attend the picnic and thus the contribution for each student is increased by Rs 20.

Cost of items.

|  |  |  |  |
| --- | --- | --- | --- |
| S. No. | Article | Cost per student | C:\Users\lakhan\Desktop\image\download - Copy.jpg |
| 1 | Entry ticket | Rs 5 |
| 2 | Coffee | Rs 10 |
| 3 | Food | Rs 25 |
| 4 | Travelling cost | Rs 50 |
| 5 | Ice-cream | Rs 15 |

19.1 Find the number of students planned for picnic.

19.2 Number of students who attended the picnic?

19.3 Calculate the total budget for this picnic.

19.4 How much money they spent for travelling –

(a) Rs 500 (b) Rs 800 (c)Rs 1000 (d)Rs 3750.

19.5 How much more money do they spent on the ice-cream as compare to coffee?

(a) Rs 400 (b) Rs 375 (c)Rs 200 (d)Rs 100.

TEST ITEM 20 SEATING ARRANGEMENT IN AUDITORIUM

In an auditorium, seats are arranged in rows and columns. The number of rows were equal to the number of seats in each row. When the number of rows were doubled and the number of seats in each row was reduced by 10, the total number of seats increased by 300.



20.1 Frame and solve the quadratic equation.

20.2 How many number of rows are there in the original arrangement.

(a) 35 (b) 20 (c) 10 (d) 30

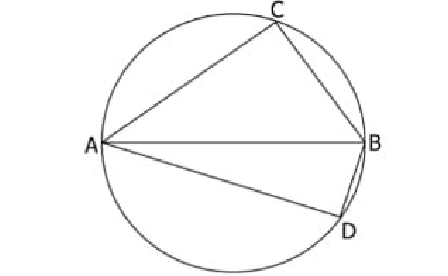
20.3 How many number of columns are there in the auditorium after re-arrangement .

(a)30 (b) 20 ( c) 40 (d) 35

20.4 Find the number of seats in the auditorium after re-arrangement.

TEST ITEM 21 LAND DONATION

A rich man donated a circular piece of land of diameter 25m to an orphanage center. The deciding committee of orphanage center planned a quadrilateral shaped park inside that circular portion as shown in figure. Where the side AC is 20m and BD is 7m. They planned to keep the area of triangle ADB for different swings, slides, seesaw etc. and the area of triangle ACB to play different types of games.



21.1 What type of triangle is ∆ACB?

(a) Acute triangle (b) obtuse triangle (c) right triangle (d) none of these

21.2 Find the value of BC and AD.

21.3 Find the area of the land which is planned for different types of swings, slides etc.

21.4 Find the area of triangle ACB to play different types of games.