Directorate of Education
Govt. of NCT of Delhi

Additional Support Material on Value Based Questions for the Session 2012-2013
SA – II

Subject: Mathematics

Class : X

Under the guidance of :

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CHAPTER – 1

## ALGEBRA (A P + QUADRATIC EQUATION)

1. Ram asks the labour to dig a well upto a depth of 10 metre. Labour charges Rs. 150 for first metre and Rs. 50 for each subsequent metres. As labour was uneducated, he claims Rs. 550 for the whole work. What should be the actual amount to be paid to the labours? What value of Ram is depicted in the question if he pays Rs. 600 to the labour?

2. Nidhi saves Rs. 2 on first day of the month, Rs. 4 on second day, Rs. 6 on third day and so on. What will be her saving in the month of Feb. 2012? What value is depicted by Nidhi?

3. 200 logs are stacked such that 20 logs are in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed? What value is depicted in the pattern of logs?

4. How many two digit numbers are there in between 6 and 102 which are divisible by 6. Ram calculated it by using A.P. while Shyam calculated it directly. Which value is depicted by Ram?

5. In a school, students thought of planting trees in an around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be the same as the class, in which they are studying e.g. a section of class-I will plant 1 tree, a section of class II will plant 2 trees and so on till class XII. There are three sections of each class. How many trees will be planted by the students? What value can you infer from the planting the trees?

6. Rs. 9000 were divided equally among a certain number of students. Amit was given the responsibility of dividing this amount among the students but 20 more students admitted to the school. Now each students got Rs. 160 less. Find the original number of students? What value of Amit is depicted in the question?

7. By a reduction of Rs. 2 per kg in the price of sugar, Anita can purchase 2 Kg sugar more for Rs. 224. Find the original price of sugar per kg. What value of Anita is depicted in the question?

8. Due to some technical problems, an aeroplane started late by one hour from it starting point. The pilot decided to increase the speed of the aeroplane by 100 km/hr. from its usual speed, to cover a journey of 1200 km in time. Find the usual speed of the aeroplane? What value (Quality) of the pilot is represented in the question?

9. A motor boat whose speed is 9 km/hr. in still water goes 12 km down stream and comes back in a total time 3 hours. Find the speed of the stream? Explain the situation when speed of stream is more than the speed of boat in still water.

10. A peacock is sitting on the top of the pillar which is 9 metre high. From the point 27 metre 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 pounces on it. If their speeds are equal, at what distance from the hole is the snake caught? What value is experienced by the peacock after catching snake?

CHAPTER – 2

CIRCLE

1. There are 3 villages A, B and C such that the distance from A to B is 7 km, from B to C is 5 km and from C to A is 8 km. The gram pradhan wants to dig a well in such a way that the distance from each villages are equal. What should be the location of well? Which value is depicted by gram pradhan?

2. People of village wants to construct a road nearest to a circular village Rampur. The road cannot pass through the village. But the people wants that road should be at the shortest distance from the center of the village (i) which road will be the nearest to the center of village? (ii) which value is depicted by the people of village?

3. Four roads have to be constructed by touching village Khanpur in circular shape of radius 1700 m in the following manner.
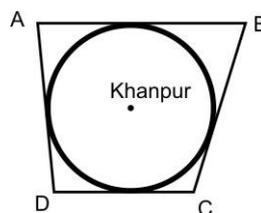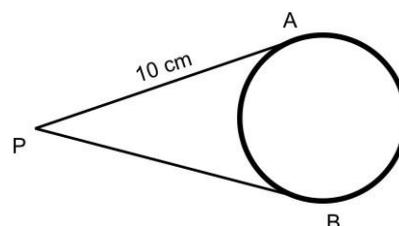

Savita got contract to construct the roads AB and CD while Vijay got contract to construct AD and BC.
Prove that AB + CD = AD + BC.

Which value is depicted by the contractor?

4. Two roads starting from P are touching a circular path at A and B.

Sarita ran from P to A 10 km and Ramesh ran from P to B. (i) If Sarita wins the race than how much distance Ramesh ran? (ii) Which value is depicted?

5. A farmer wants to divide a sugarcane of 7 ft length between his son and daughter equally. Divide it Geometrically, considering sugarcane as a line of 7 cm, using construction.

$$\overset{A}{\vdash}\!\rule{8cm}{0.4pt}\!\overset{B}{\dashv}$$

(i) Find the length of each part.

(ii) Which value is depicted?

CHAPTER – 3

APPLICATIONS OF TRIGONOMETRY

1. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle 30° with it. The distance between the foot of the tree to the point where the top touches the ground is 8 m. The teacher asked the students to find the height of the tree. All the students failed but Neeraj took initiative and calculated it correctly using trigonometry. What height Neeraj calculated? What quality of Neeraj is depicted here?

2. A person, standing on the bank of a river, observes that the angle subtended by a tree on the opposite bank is 60°. When he retreates 20 m from the bank, he finds the angle to be 30°. Find the height of the tree and the breadth of the river? What skill is used by the person.

3. Anand is watching a circus artist climbing a 20 m long rope which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole if the angle made by the rope with the ground level is 30°. What value is experienced by Anand?

4. A pilot is flying an areoplane at an altitude of 1800 m observes that two ships are sailing towards it in the opposite directions. The angles of depressions of the ships as observed from the aeroplane are 60° & 30° respectively. Find the distance between the two ships? What value of the pilot is shown?

5. The angle of elevation of a bird observed by a hunter who is 12 m above a lake is 30° and the angle of depression of bird's reflection in the lake is 60°. Find the distance between the bird and the hunter. What value is used by the hunter if he want to hit the bird?

CHAPTER – 4

PROBABILITY

1. In a class discussion, Himanshu says that the probability of an event can't be – 1.3. He shows

       (a) Truth value   (b) Economical value

       (c) Leadership   (d) Environmental value

2. $P(E) + P(\bar{E}) = 1$

   The statement depicts _____ value

3. E be an event associated with a random experiment and $0 \leq P(E) \leq x$. Find the max value of x? Which value is depicted by this statement?

4. If E_1, E_2, E_3 are the possible elementary events of a random experiment and

   $P(E_1) + P(E_2) = \dfrac{2}{3}$ Show that $P(E_3) = \dfrac{1}{3}$

   Which value is depicted by this?

5. A selection committee interviewed some people for the post of Sales Manager. The committee wanted that the female candidates should also be given the fair chance. So they called male and female candidates in 3:4 ratio.

   a. What is the probability of a female candidate being selected?

   b. Which value is shown by the selection committee?

6. 12 defective ball pens are accidentally mixed with 156 good one. It is not possible to just look at pen and tell whether or not it is defective. The shopkeeper draws one pen at random.

   a. Determine the probability that the pen taken out is a good one.

   b. Suppose the pen drawn is defective. The shopkeeper did not sell out and kept the pen aside. He again draws one more pen at random from the rest. What is the probability that pen is not defective.

   c. Which value is shown by the shopkeeper?

7. During Van Mahotsav a group of students, planted a number of plants in 20 houses of a locality.

No. of Plants	0-2	2-4	4-6	6-8	8-10	10-12	12-14
No. of Houses	x	$2x$	x	$2x+3$	$6x$	$2x$	$2x+1$

a. What is the probability of houses who has plants ≤ 8?

b. Which value is depicted by students?

8. Ramesh has got ₹24000/- as Puja Bonus. He donated ₹5000/- to temple. He gave ₹12000/- to his wife, ₹2000/- to his servant and gave rest of the amount to his daughter.

a. What is the probability of wife's share?

b. Calculate the probability of servant's share?

c. What is the probability of daughter's share?

d. Which value are depicted by Ramesh from the way the amount is distributed?

9. Due to some default in the engine of a helicopter, a pilot has to make an emergency landing in an area as shown in the given figure.
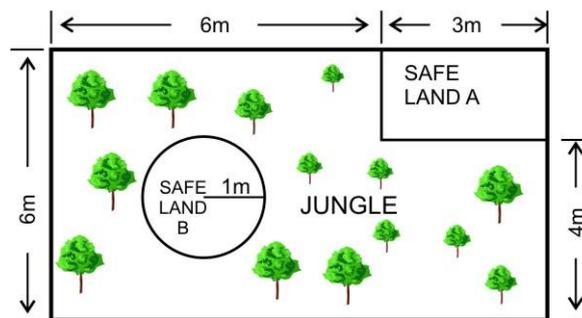
a. What is the probability of safe landing?

b. What is the probability of landing in jungle?

c. Due to bigger area, the pilot decided to land on safe land A rather than safe land B.

Which value is shown by the pilot?

10. In a co-operative society, 60 people go to same office. They all use their conveyance. 10 people use their scooters, 10 go by their cars and the rest use their motorcycles.

a. What is the probability of people going by motorcycle?

b. One day they all decided to go by cars but a car can accommodate only 5 people. What is the probability of people going by car now?

c. What is the probability of people not going by cars now?

d. Which value is shown in 'b'?

11. 240 students reside in a Hostel. Out of which 50% go for the yoga classes early in the morning 25% have joined the Gym club and 15% of them go for the morning walk. Rest of the students have joined the laughing club.

    a. What is the probability of students who have joined the laughing club?

    b. What is the probability of students who have not joined any class or club?

    c. Which value is depicted by students?

CHAPTER – 5

COORDINATE GEOMETRY

1. There are two routes to travel from source A to destination B by bus. First bus reaches at B via point C and second bus reaches from A to B directly. If coordinates of A, B and C are (-2, -3), (2, 3) and (3, 2) respectively then by which bus do you want to travel from A to B (Assume that both buses have same speed.) Which value is depicted in the question?

2. In a sports day celebration, Ram and Shyam are standing at positions A and B whose coordinates are (2, -2) and (4, 8) respectively. The teacher asked Geeta to fix the country flag at the mid point of the line joining points A and B. Find the coordinates of the mid point? Which type of value would you infer from the question?

3. To raise social awareness about hazards of smoking, a school decided to start "No Smoking" campaign. 10 students are asked to prepare campaign banners in the shape of triangle as shown in the fig. If cost of 1 cm^2 of banner is Rs.2 then find the overall cost incurred on such campaign. Which value is depicted in the question?
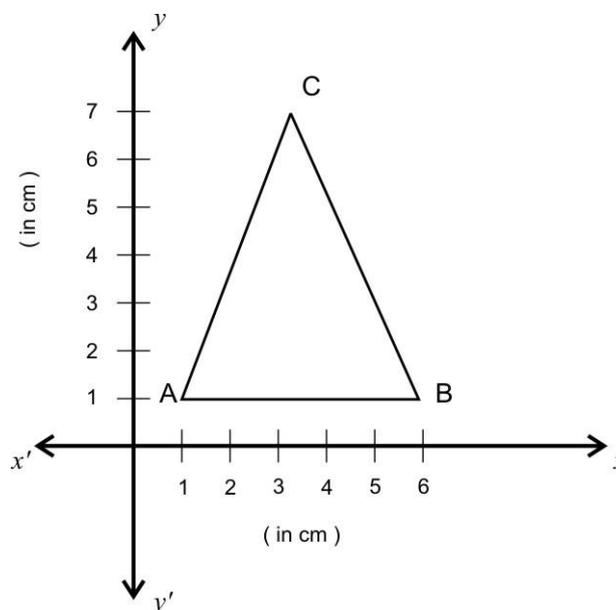
4. The coordinates of the houses of Sameer and Rahim are (7, 3) and (4, -3) whereas the coordinates of their school is (2, 2). If both leaves their houses at the same time in the morning and also reaches school on time then who travel faster? Which value is depicted in the question?

5. There are two types of fields are available as shown in the fig. which type of field will you purchase if both have same cost? Which value is depicted in the question?
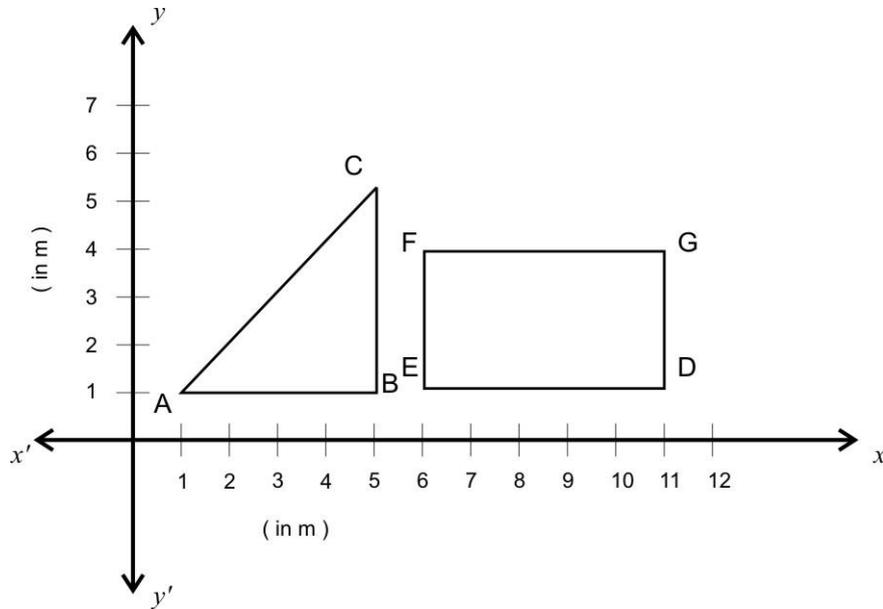
CHAPTER – 6

MENSURATION

1. An ice cream seller has two types of ice cream container in the form of cylindrical shape and a cone with hemi-spherical base. Both have same height of 7 cm and same diameter of 7 cm. The cost of container are same but the seller decide to sell ice cream in cylindrical containers. (i) Calculate the volume of the both containers. (ii) Which value is depicted by the seller?

2. Two types of water tankers are available in a shop. One is in a cubic form of dimensions 1 m x 1 m x 1 m and another is in the form of cylindrical form of diameter 1 m and height is also 1 m. Calculate the volume of both tankers. The shopkeeper advise to purchase cuboid tank. Which value is depicted?
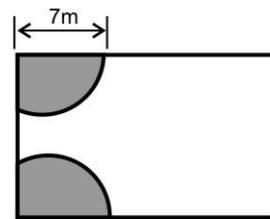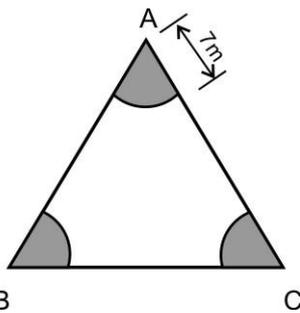
3. Farmer has two types of field in the form of triangle and rectangle. Geeta is allowed to cut the grass of triangular field (shaded position) and Vijay is allowed to cut the grass of rectangular field (shaded portion) in the following manner. Calculate the areas of both shaded portions? Which value is depicted?

4. A farmer has two types of fields, one is in the form of a squared area 144 m^2 and another is in the form of a rectangle of sides 16 m and 8 m. Farmer wants to fence his field. So he gave this work to Ramesh for Square field and Sarita for rectangular field. Find the Length of fencing of both the fields. Which value is depicted?

5. A farmer wants to dig a well either in the form of cuboid of dimensions (1m x 1m x 7m) or in the form of cylinder of diameter 1 meter and radius 7m. The rate to dig the well is Rs. 50/m^3. Find the cost to dig both wells. The farmer decides to dig the cylindrical well. By his decision which value is depicted?

ANSWER SHEET

ALGEBRA (A.P. + QUADRATIC EQUATIONS)

1. Rs. 600, Honesty, Sincerity.

2. Rs. 870, Economy, Saving

3. 16, Space saving, Creative, Reasoning, Balancing

4. 15, Time Saving, Seasoning

5. 234, Environmental, Social

6. 25, Logical, Sincerity, Leadership

7. Rs. 16, Economical, Saving, Leadership

8. 300 km/hr, Leadership, Punctuality

9. 3 km/hr., Logically, if speed of stream is more than speed of boat in still water then the boat will not sail.

10. 12 m.

CIRCLE

1. A, B, C will lie on the circumference of the circle and location of well will be at the centre of the circle. Social, Honesty, Equality.

2. (i) Tangent of the circle (ii) Economical

3. Gender equality

4. 10 km, Gender equality

5. 3.5 ft, Gender equality.

APPLICATION OF TRIGNOMETRY

1. $8\sqrt{3}$ m, Leadership Logical, Reasoning.

2. $10\sqrt{3}$ m, 10 m, Logical

3. 10 m, 30 y, Fun, Entertainment

4. $2400\sqrt{3}$ m, Reasoning, Logical

5. 24 m, Accuracy, Concentration, Confidence, Focus, Anticipation, Reasoning.

PROBABILITY

1. Truth value.

2. Righteous value.

3. 1, Righteous value.

4. Righteous value.

5. (a) $\dfrac{4}{7}$ (b) Gender equlaity.

6. (a) $\dfrac{13}{14}$ (b) $\dfrac{156}{167}$ (c) Honesty

7. (a) $\dfrac{9}{20}$ (b) Environmental value

8. (a) $\dfrac{1}{2}$ (b) $\dfrac{1}{12}$ (c) $\dfrac{5}{24}$ (d) Social value, religious value.

9. (a) $\dfrac{6+\pi}{54}$ (b) $\dfrac{48-\pi}{54}$ (c) Leadership

10. (a) $\dfrac{2}{3}$ (b) $\dfrac{5}{6}$ (c) $\dfrac{1}{6}$

11. (a) $\dfrac{1}{10}$ (b) $\dfrac{3}{20}$ (c) Physical Fitness

CO-ORDINATE GEOMETRY

1. By direct route from A to B. Reasoning, Time saving, Economical

2. (3, 3), Enjoyment, Reasoning.

3. Rs. 300, Social awareness

4. Samir, Punctuality, Sincerity.

5. Rectangular, Economical

MENSURATION

1. $\dfrac{343}{4}\pi cm^3$, $\dfrac{343}{8}\pi cm^3$, Honesty.

2. 1 m^3, 0.785 m^3, Honesty

3. $245\pi m^2$, $24.5\ m^2$, Gender equality.

4. 48m, 48m, Gender equality.

5. Rs. 350, Rs. 275, Economical