**Height and Distance**

1. C:\Users\tsuser.PC\Desktop\final.pngThe angle of elevation of a tower from a distance 100 m from its foot is 30°. Height of the tower is   
   a) 100/√3m b) 50√3m c) 200√3m d) 100√3m
2. C:\Users\tsuser.PC\Desktop\final.pngThe tops of two poles of height 24 m and 36 m are connected by a wire. If the wire makes an angle of 60° with the horizontal, then the length of the wire is   
   a) 6m b) 8√3m c) 8m d) 6√3m
3. C:\Users\tsuser.PC\Desktop\final.pngFrom a point A on the ground, the angle of elevation of the top of a 20m tall building is 45˚. A flag is hoisted at the top of the building and the angle of the elevation of the top of the flagstaff from A is 60˚. Find the length of flagstaff and the distance of the building from point A.   
   a) 20m, 14.64m b) 24m, 16.24m   
   c) 26m, 16m d) 32m, 14.54m
4. C:\Users\tsuser.PC\Desktop\final.pngA man standing in one corner of a square football field observes that, the angle subtended by a pole in the corner just diagonally opposite to this corner is 60˚. When he retires 80m from the corner, along the same straight line, he finds the angle to be 30˚. What is the length of the field?   
   a) 40m b) 120m c) 40√2m d) 20√2m
5. C:\Users\tsuser.PC\Desktop\final.pngThe angles of depression of two ships from the top of a light house are 45˚ and 30˚ towards East. If the ships are 200m apart, find the height of the light house?   
   a) 100m b) 173m c) 200m d) 273m
6. C:\Users\tsuser.PC\Desktop\final.pngWhen the angle of elevation of the sun increases from 30° to 60°, the shadow of a post is diminished by 5 meters. Then the height of the post is   
   a) 5√3/2m b) 2√3/5m c) 2/5√3m d) 4/5√3m
7. C:\Users\tsuser.PC\Desktop\final.pngA tower standing on a horizontal plane subtends a certain angle at a point 160m apart from the foot of the tower on advancing 100m towards it, the tower is found to subtend an angle two as before. What is the height of the tower?   
   a) 80m b) 100m c) 160m d) 200m
8. C:\Users\tsuser.PC\Desktop\final.pngA tree breaks due to storm and the broken part bends so that the top of the tree touches the grand making an angle of 30˚ with it. The distance between the feet of the tree to the point where the top touches the ground is 12m. Find the height of the tree?   
   a) 12/√3m b) 8/√3m c) 12√3m d) 4√3m
9. C:\Users\tsuser.PC\Desktop\final.pngTow posts are x meters apart and the height of one is double that of other. If from the mid-point of the line joining their feet, an observer finds the angular elevations of their tops to be complementary, and then what is the height of the shorter post?   
   a) x√2 b) 𝑥/√2 c) 𝑥√2√2 d) 𝑥/4
10. C:\Users\tsuser.PC\Desktop\final.pngA pole stands vertically, inside a scalene triangular part ABC. If the angle of elevation of the top of the pole from each corner of the park is same, then in Δ ABC, the foot of the pole is at the   
    a) centroid b) circumcentre   
    c) incentre d) orthocenter
11. A rail road curve is to be laid out on a circle. What radius should be used if the track is to change direction by 25° in a distance of 40 meters?   
    a) 91.64 meters b) 90.46 meters   
    c) 89.64 meters d) 93.64 meters
12. A telegraph post is bent at a point above the ground due to strom. Its top just meets the ground at a distance of 8√3 metres from its foot and makes an angle of 30°, then the height of the post is:   
    a) 16 meters b) 23 meters c) 24 meters d) 10 meters
13. There are two vertical posts, one on each side of a road, just opposite to each other. One post is 108 meter high. From the top of this post, the angles of depression of the top and foot of the other post are 30° and 60° respectively. The height of the other post, in meter, is   
    a) 36 b) 72 c) 108 d) 110
14. The angles of elevation of the top of a building and the top of the chimney on the roof of the building from a point on the ground are x and 45° respectively. The height of building is h meter. Then the height of the chimney, in meter, is:   
    a) h cot x + h b) h cot x – h c) h tan x – h d) h tan x + h
15. An aeroplane when flying at a height of 5000m from the ground passes vertically above another aeroplane at an instant, when the angles of elevation of the two aeroplanes from the same point on the ground are 60° and 45° respectively. The vertical distance between the aeroplanes at that instant is   
    a) 5000(√3 – 1)m b) 5000(3 – √3)m   
    c) 5000(1 – 1/√3)m d) 4500m
16. A man standing at a point P is watching the top of a tower, which makes an angle of elevation of 30°. The man walks some distance towards the tower and then his angle of elevation of the top of the tower is 60°. If the height of the tower is 30m, then the distance he moves is   
    a) 22m b) 22√3m c) 20m d) 20√3m
17. The distance between two vertical poles is 60m. The height of one of the poles is double the height of the other. The angles of elevation of the top of the poles from the middle point of the line segment joining their feet are complementary to each other. The heights of the poles are:   
    a) 10m and 20m b) 20m and 40m   
    c) 20.9m and 41.8m d) 15√2m and 30√2m
18. There are two temples, one on each bank of a river, just opposite to each other. One temple is 54m high. From the top of this temple, the angles of depression of the top and the foot of the other temple are 30° and 60° respectively. The length of the temple is:   
    a) 18m b) 36m c) 36√3m d) 18√3m
19. An aeroplane when flying at a height of 3125m from the ground passes vertically below another plane at an instant when the angles of elevation of the two planes from the same point on the ground are 30° and 60° respectively. The distance between the two planes at that instant is   
    a) 6520m b) 6000m c) 5000m d) 6250m
20. The shadow of the tower becomes 60 meters longer when the altitude of the sum changes from 45° to 30°. Then the height of the tower is   
    a) 20(√3 + 1)m b) 24(√3 + 1)m   
    c) 30(√3 + 1)m d) 30(√3 – 1)m

**Answers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 - a | 2 - b | 3 - a | 4 - d | 5 - d | 6 - a | 7 - a | 8 - c | 9 - c | 10 - c |
| 11 - a | 12 - c | 13 - b | 14 - b | 15 - c | 16 - d | 17 - d | 18 - b | 19 - d | 20 - c |

**Additional Examples**

1. C:\Users\tsuser.PC\Desktop\final.pngThe angle of elevation of the top of a TV tower from three points A, B and C in a straight line through the foot of the tower are 𝛼, 2𝛼 and 3𝛼, respectively. If AB = x, then the height of the tower is   
   a) x cos𝛼 b) x sin2𝛼 c) x sin3𝛼 d) x tan𝛼
2. C:\Users\tsuser.PC\Desktop\final.pngThe length of a string between a kite and a point on the ground is 65 m. If the string makes an angle 𝛼 with the level ground such that 𝑡𝑎𝑛𝛼 = 125, how high is the kite?   
   a) 60m b) 40m c) 35m d) 25m
3. C:\Users\tsuser.PC\Desktop\final.pngThe angle of elevation of an aeroplane from a point on the ground is 45°. After 15 second’s flight, the elevation changes to 30°. If the aeroplane is flying at a height of 3000m, then the approximate speed of the plane in km per hour is …………   
   a) 304.32 b) 152.16 c) 527 d) 263.5
4. C:\Users\tsuser.PC\Desktop\final.pngA flagstaff of height (1/5) of the height of a tower is mounted on the top of the tower. If the angle of elevation of the top of the flagstaff as seen from the ground is 45° and the angle of elevation of the top of the tower as seen from the same place is 𝜃, then the value of tan 𝜃 is   
   a) 6/5 b) 5√3/6 c) 5/6 d) 4/5
5. A man standing in one corner of a square football field observes that the angle subtended by a pole in the corner just diagonally opposite to this corner is 60*°*. When he retires 80m from the corner, along the same straight line. He finds the angle to be 30*°*. The length of the field, in m, is:   
   a) 40 b) 20√2 c) 20 d) 40√2
6. C:\Users\tsuser.PC\Desktop\final.pngFrom the top of a pillar of height 20m the angles of elevation and depression of the top and bottom of another pillar are 30*°* and 45*°* respectively. The height of the second pillar (in metre) is:   
   a) 20/√3 (√3−1) m b) 20/√3 (√3+1) m   
   c) 20√3 m d) 20/√3 m
7. A balloon of radius r makes an angle 𝛼 at the eye of an observer and the angle of elevation of its centre is 𝛽. The height of its centre from the ground level is given by: a) r sin 𝛽 cosec 𝛼/2 b) r cosec 𝛼 /2 sin 𝛼   
   c) r cosec 𝛼 sin 𝛽 d) None of these
8. At the foot of a mountain the elevation of its summit is 45*°*; after ascending 1000m towards the mountain up a slope of 30*°* inclination, the elevation is found to be 60°, Find the height of the mountain:   
   a) (√3+1)/2km b) (√3−1)/2km c) √3/2km d) 1/√3km
9. A tower on horizontal ground leans towards the north. At two points due south at distance a and b respectively from the foot, the angular elevations of the top of the tower are 𝛼 and 𝛽. Find the inclination 𝜃 of the tower to the horizon.   
   a) 𝑏cot𝛼+𝑎 𝑐𝑜𝑡𝛽/𝑎−𝑏 b) 𝑏sin𝛼+𝑏cos𝛽/𝑏−𝑎   
   c) 𝑏cot𝛼−𝑎cot𝛽/𝑏−𝑎 d) None of these
10. P and Q are two points observed from the top of a building 10√3 m high. If the angles of depression of the points are complementary and PQ = 20 m, then the distance of P from the building is   
    a) 25m b) 45m c) 30m d) 40m

**Answers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 - b | 2 - a | 3 - c | 4 - c | 5 - b | 6 - b | 7 - a | 8 - a | 9 - b | 10 - c |

1. C:\Users\tsuser.PC\Desktop\final.pngThe sum of 5 consecutive odd numbers is 575. What will be the sum of the next set of 5 consecutive odd numbers?

1) 625 2) 580 3) 600 4) 650 5) None of these

1. The sum of 5 consecutive even numbers is 200. What will be the sum of the next set of 5 consecutive even numbers?

1) 240 2) 250 3) 300 4) 225 5) None of these

1. The average of four positive integers is 59. The highest integer is 83 and the lowest integer is 29. The difference between the remaining two integers is 28. Which of the following integers is the higher of the remaining two integers?

1) 34 2) 76 3) 39 4) Cannot be determined 5) None of these

1. C:\Users\tsuser.PC\Desktop\final.pngA boy has to find the average of 25 positive integers. Each integer contains two digits. By mistake, the boy interchanges the digits of one number and finds the average 2.88 less than the real average. What is the difference between the two digits of that number?  **[July 12, 2014 @ 1h 54m 13s]**   
   1) 6 2) 8 3) 4 4) 7 5) None of these

**Answers**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 - 5 | 2 - 1 | 3 - 2 | 4 - 4 | 5 - 4 |
| 6 - 2 | 7 - 5 | 8 - 1 | 9 - 1 | 10 - 4 |
| 11 - 2 | 12 - 1 | 13 - 1 | 14 - 5 | 15 - 2 |
| 16 - 3 | 17 - 5 | 18 - 4 | 19 - 3 | 20 - 3 |
| 21 - 3 | 22 - 2 | 23 - 4 | 24 - 2 | 25 - 4 |
| 26 - 4 | 27 - 3 | 28 - 4 | 29 - 1 | 30 - 2 |
| 31 - 1 | 32 - 1 | 33 - 2 | 34 - 2 | 35 - 2 |

**Note:** The date and time mentioned against some questions refer to the doubts clarification session on Quantitative Aptitude in which the question was solved.

**Additional Examples**

1. C:\Users\tsuser.PC\Desktop\final.pngThe average of the first 100 positive integers is   
   a) 100 b) 51 c) 50.5 d) 49.5
2. C:\Users\tsuser.PC\Desktop\final.pngThe average of the first nine integral multiples of 3 is   
   a) 21 b) 12 c) 15 d) 18
3. C:\Users\tsuser.PC\Desktop\final.pngIf a, b, c, d and e are five consecutive odd numbers, their average is –   
   a) 5(a+b) b) abcde/5   
   c) 5(a+b+c+d+e) d) a+4
4. C:\Users\tsuser.PC\Desktop\final.pngThe average of 18 observations is recorded as 124. Later it was found that two observations with values 64 and 28 were entered wrongly as 46 and 82. Find the correct average of the 18 observations.   
   a) 111 79 b) 122 c) 123 d) 137 79
5. C:\Users\tsuser.PC\Desktop\final.pngThe average mathematics marks of two Sections A and B of Class IX in the annual examination is 74. The average marks of Section A are 77.5 and that of Section B is 70. The ratio of the number of students of Sections A and B is   
   a) 7:8 b) 7:5 c) 8:7 d) 8:5
6. C:\Users\tsuser.PC\Desktop\final.pngThe average age of 11 players of a cricket team is increased by 2 months when two of them gained 18 years and 20 years are replaced by two new players. The average age of the new players is   
   a) 19 years 1 month b) 19 years 6 months   
   c) 19 years 11 months d) 19 years 5 months
7. C:\Users\tsuser.PC\Desktop\final.pngOut of 10 teachers of a school, one teacher retires and in its place, a new teacher of age 25 years joins. As a result, average age of teachers is reduced by 3 years. The age (in years) of the retired teacher is   
   a) 58 b) 60 c) 55 d) 50
8. C:\Users\tsuser.PC\Desktop\final.pngThe average age of Ram and his two children is 17 years and the average age of Ram’s wife and the same children is 16 years. If the age of Ram is 33 years, the age of his wife is (in years)   
   a) 31 b) 32 c) 35 d) 30
9. C:\Users\tsuser.PC\Desktop\final.pngA man’s pension on retirement from service is equal to half the average salary during last 3 years of his service. His salary form 1-1-1983 is ` 380 per month with increment of Rs. 40 due on 1-10-83, 1-10-84 and 1-10-85. If he retires on 1-1-86, what pension does he draw?   
   a) 205 b) ` 215 c) ` 225 d) ` 230
10. C:\Users\tsuser.PC\Desktop\final.pngThe average of 50 numbers is 38. If two numbers namely 45 and 55 are discarded, the average of the remaining numbers is **[June 4, 2016 @ 2h 03m 14s]**   
    a) 35 b) 32.5 c) 37.5 d) 36
11. The average age of the jury of 5 is 40. If a member aged 35 resigns and a managed 25 becomes a member, then the average age of the new jury is\_   
    a) 30 b) 38 c) 40 d) 42
12. The average of nine numbers is 50. The average of the first five numbers is 54 and that of the last three numbers is 52. Then the sixth number is   
    a) 30 b) 34 c) 24 d) 44
13. The average of 20 numbers is 15 and the average of first 5 is 12. The average of the rest is-   
    a) 16 b) 15 c) 14 d) 13
14. C:\Users\tsuser.PC\Desktop\final.pngOut of 4 numbers, whose average is 60, the first one is one-fourth of the sum of the least three. The first number is **[June 4, 2016 @ 2h 05m 40s]**   
    a) 15 b) 45 c) 48 d) 60
15. The average of 25 observations is 13. It was later found that an observation 73 was wrongly entered as 48. The new average is   
    a) 12.6 b) 14 c) 15 d) 13.8
16. Among three numbers, the first is twice the second and thrice the third. If the average of the three numbers is 49.5, then the difference between the first and the third number is   
    a) 54 b) 28 c) 39.5 d) 41.5
17. The mean of 50 numbers is 30. Later it was discovered that two entries were wrongly entered as 82 and 13 instead of 28 and 31. Find the correct mean.   
    a) 36.12 b) 30.66 c) 29.28 d) 38.21
18. The average of three consecutive odd numbers is 12 more than one third of the first of these numbers. What is the last of the three numbers?   
    a) 15 b) 17 c) 19 d) Data inadequate
19. The average weight of a group of 20 boys was calculated to be 89.4 kg and it was later discovered that one weight was misread as 78 kg instead of 87 kg. The correct average weight is   
    a) 88.95 kg b) 89.25 kg c) 89.55 kg d) 89.85 kg
20. In a family, the average age of a father and a mother is 35 years. The average age of the father, mother and their only son is 27 years. What is the age of the son?   
    a) 12 years b) 11 years c) 10.5 years d) 10 years

**Answers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 - c | 2 - c | 3 - d | 4 - b | 5 - c | 6 - c | 7 - c | 8 - d | 9 - b | 10 - c |
| 11 - b | 12 - c | 13 - a | 14 - c | 15 - b | 16 - a | 17 - c | 18 - c | 19 - d | 20 - b |