Term 1 - Full Test

Subject: Mathematics Time: 01:30 hrs

Instructions:

- The question paper contains three sections.
- Section A (**1 - 20**) has 20 questions. Attempt any 16 questions.
- Section B (**21 - 40**) has 20 questions. Attempt any 16 questions.
- Section C (**41 - 50**) has 10 questions based on two Case Studies. Attempt any 8 questions.
- All questions carry equal marks.
- There is no negative marking.

1. Using Euclid's division lemma, find the HCF of 1848, 3058 and 1331.

   A. 11

   B. 13

   C. 14

   D. 9

2. The difference of two numbers is 1365. On dividing the larger number by the smaller, we get 6 as quotient and 15 as remainder. What is the smaller number ?

   A. 240

   B. 270

   C. 295

   D. 360

3. Find the largest number which can divide both 324 and 144.

A. 21

B. 9

C. 36

D. 18

4. 1400^n is NOT divisible by which of the following, if n is a natural number:

A. 100

B. 175

C. 56

D. 210

5. There is a circular track with the distance of track from centre as 10 m. Ram runs a distance of 21 m on the track. What is the angle in degrees covered by Ram with respect to the centre of track?

A. 76°

B. 63°

C. 56°

D. 90°

6. Ritu can row downstream 20 km in 2 hours, and upstream 4 km in 2 hours. Find her speed of rowing in still water and the speed of the current.

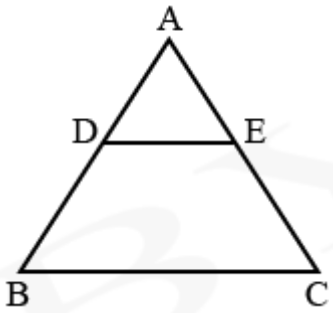
A. (6,4)

B. (4,6)

C. (8,12)

D. (12,8)

7. In ΔABC, if DE divides AB and AC in the same ratio, then which of the following options is true?



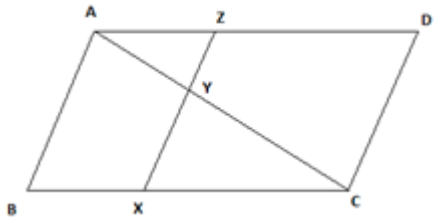
A. AD = AE

B. AD = DB

C. DE and BC are parallel

D. DE is half of BC

8. $ABCD$ is a parallelogram with diagonal AC. If a line XZ is drawn such that $XZ \parallel AB$ and cuts AC at Y then, find $\frac{BX}{XC}$.



A. $\frac{AY}{AC}$

B. $\frac{DZ}{AZ}$

C. $\frac{AZ}{ZD}$

D. $\frac{AC}{AY}$

9. Find the trigonometric ratio equivalent to the following:

$sin55^\circ + cos20^\circ + cot70^\circ + cosec85^\circ$

A. $cos35^\circ + sin20^\circ + tan20^\circ + sec5^\circ$

B. $cos35^\circ + sin70^\circ + tan20^\circ + sec5^\circ$

C. $cos35^\circ + sin20^\circ + tan70^\circ + sec5^\circ$

D. $cos35^\circ + sin20^\circ + tan70^\circ + sec85^\circ$

10. If in a right-angled triangle ABC angles A and B are acute, then evaluate

1 + $\frac{tanA}{tanB}$ =

A. 1

B. sec^2A

C. secA

D. 2

11. A card is drawn from a well-shuffled deck of playing cards. Find the probability of drawing a black card which is neither a face card nor an ace?

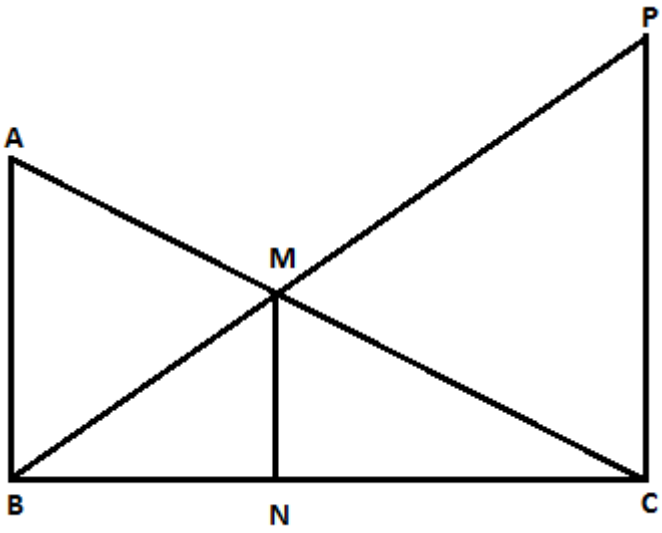
A. $\frac{9}{52}$

B. $\frac{9}{26}$

C. $\frac{9}{13}$

D. $\frac{10}{13}$

12.



In the above figure, $AB \parallel MN \parallel PC$, then which of the following will be true?

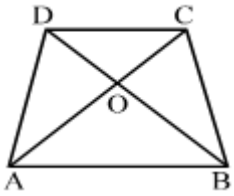
A. $\frac{1}{MN} + \frac{1}{PC} = \frac{1}{AB}$

B. $\frac{1}{AB} + \frac{1}{MN} = \frac{1}{PC}$

C. $\frac{1}{AB} + \frac{1}{PC} = \frac{1}{MN}$

D. $\frac{1}{AB} - \frac{1}{PC} = \frac{1}{MN}$

13.



In this figure, ABCD is a trapezium in which AB || DC and AB = 3DC. Determine the ratio of the areas of △ AOB and △COD.

A. 4 : 1

B. 16 : 1

C. 3 : 4

D. 9 : 1

14. Which of the following has a non terminating decimal expansion?

A. $\frac{17}{210}$

B. $\frac{23}{8}$

C. $\frac{17}{80}$

D. $\frac{35}{50}$

15. The decimal expansion of $\frac{141}{120}$ will terminate after how many places?

A. 3

B. 5

C. 7

D. Will not terminate

16. The value of $(1+cot\theta-cosec\theta)(1+tan\theta+sec\theta)$ is

A. 1

B. 2

C. 4

D. 0

17. $\sqrt{1+tan^2\theta}\sqrt{1+cot^2\theta}\sqrt{1-cos^2\theta}\sqrt{1-sin^2\theta}=$

A. $sec\theta$

B. $cos\theta$

C. $sin\theta$

D. 1

18. Find the probability of getting two heads when two coins are tossed simultaneously.

A. $\frac{1}{2}$

B. $\frac{1}{3}$

C. $\frac{1}{4}$

D. 1

19. Two numbers are in the ratio of 15:11. If their H.C.F is 13, the numbers will be:

A. 195 and 143

B. 190 and 140

C. 185 and 163

D. 185 and 143

20. $\frac{sin\ 42^\circ}{sec\ 48^\circ} + \frac{cos\ 42^\circ}{cosec\ 48^\circ} - \frac{4}{3}sin^2 30^\circ =$___

A. $\frac{-2}{3}$

B. $\frac{2}{3}$

C. $\frac{1}{3}$

D. 1

21. $\triangle ABC$ is right angled at B and the perpendicular drawn from B to the opposite side AC bisects it at D. If AD = DC = 5 cm, then find the length of BD.

A. 5 cm

B. 10 cm

C. 25 cm

D. 12.5 cm

22. What is the probability of getting a sum of 11 when a pair of dice is rolled?

A. 0

B. $\frac{1}{18}$

C. $\frac{1}{12}$

D. $\frac{1}{11}$

23. The points on X-axis at a distance of 10 units from (11, –8) are _____.

A. (5, 0) and (16, 0)

B. (6, 0) and (17, 0)

C. (5, 0) and (17, 0)

D. (5, 2) and (17, 0)

24. A box contains 3 black balls, 4 red balls and 3 green balls. All the balls are identical in shape and size. Rohit takes out a ball from the bag without looking into it. What is the probability that the ball drawn is a black ball?

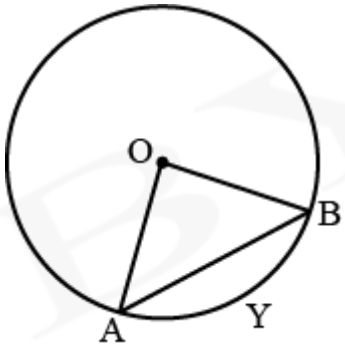
A. $\frac{3}{10}$

B. $\frac{4}{10}$

C. $\frac{2}{5}$

D. $\frac{1}{2}$

25. A chord AB of length 5 cm is drawn in a circle in such a way that if its endpoints A and B are joined from the centre of the circle, then it forms an equilateral $\triangle$. Find the area of the sector OAYB as shown in the figure.



A. 16.64 cm^2

B. 14.28 cm^2

C. 15.23 cm^2

D. 13.09 cm^2

26. For what value of k is (-2) a zero of the polynomial $x^2 - x - (2k + 2)$?

A. 1

B. 2

C. - 1

D. - 2

27. 3 people A, B and C are sitting in a circular fashion. Find the probability that A and B do not sit together.

A. 0

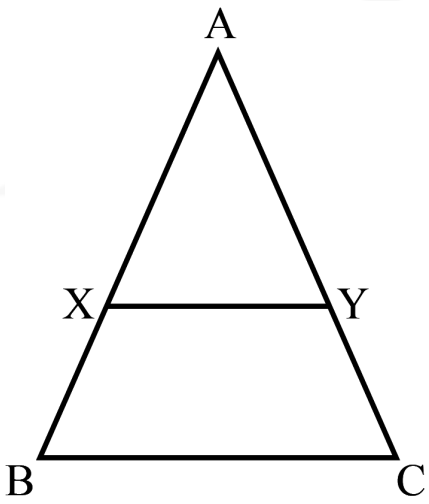
B. $\frac{1}{2}$

C. $\frac{1}{3}$

D. 1

28. In the following figure, triangle AXY is isosceles with $\angle AXY = \angle AYX$.

If $\frac{BX}{AX} = \frac{CY}{AY}$, then triangle ABC is _____.



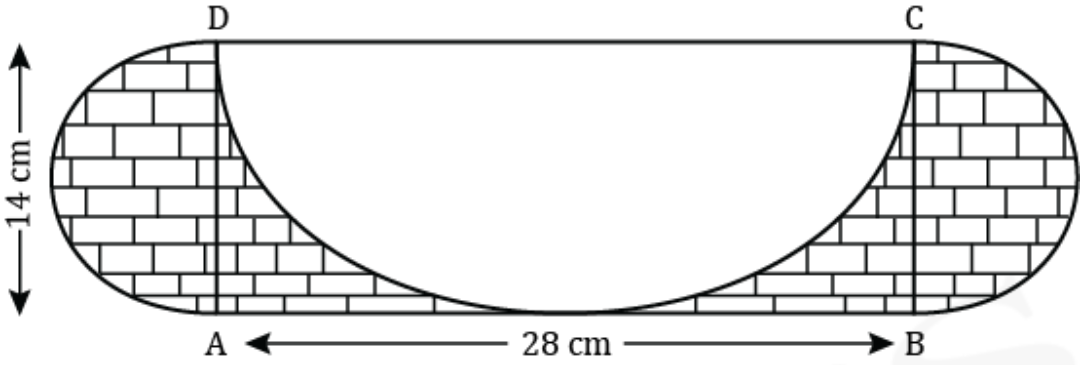
A. scalene

B. isosceles

C. equilateral

D. isosceles right angled

29. ABCD is a rectangle with AB = 28 cm and BC = 14 cm. Taking DC, BC, and AD as diameters, three semicircles are drawn as shown in the figure. Find the area of shaded region. (Use $\pi = \frac{22}{7}$)



A. 438 cm^2

B. 338 cm^2

C. 200 cm^2

D. 238 cm^2

30. If $sin\ A + sin^2 A = 1$, then $cos^2\ A + cos^4\ A = ?$

A. 0

B. 1

C. 2

D. 3

31. Sum of two numbers is 4 more than the twice of difference of the two numbers. If one of the two numbers is three more than the other number, then find the numbers.

A. $(\frac{13}{2}, \frac{7}{2})$

B. (1, 3)

C. $(\frac{4}{5}, 3)$

D. (1, 2)

32. Which of the following is a solution to $3x + 4y = 38$?

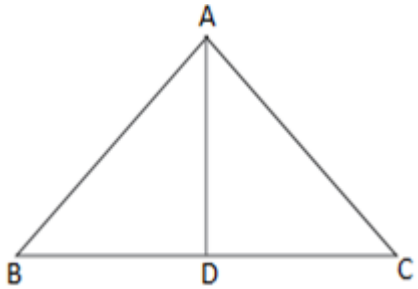
A. (3, 4)

B. (6, 5)

C. (2, 19)

D. (3, 12)

33. In ΔABC, AD is the median. Which of these conditions should be satisfied to make ΔADB and ΔADC similar triangles?



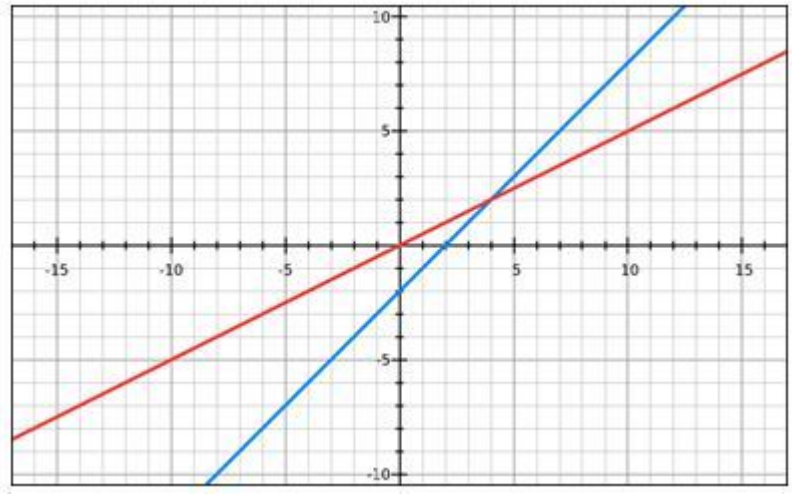
A. $\angle A = 90^\circ$

B. $AB = AC$

C. $\angle B = \angle A$

D. $BD = AD$

34. What is the solution of the graph given below?



A. $x = 0,\ y = 0$

B. $x = 4,\ y = 2$

C. $x = 5,\ y = 2$

D. $x = -5,\ y = 2$

35. If $3sin\theta + 4cos\theta = 5$, then the value of $sin\theta$ is _____.

A. $\frac{2}{3}$

B. $\frac{4}{5}$

C. $\frac{3}{5}$

D. $\frac{5}{3}$

36. For what value of k, will the following pair of linear equations in two variable have infinitely many solutions?

$2x + 3y = 4, (k + 2)x + 6y = 3k + 2$

A. k = 2

B. k = 3

C. k = 4

D. k = 5

37. What is the probability of not picking a face card when you draw a card at random from a pack of 52 cards?

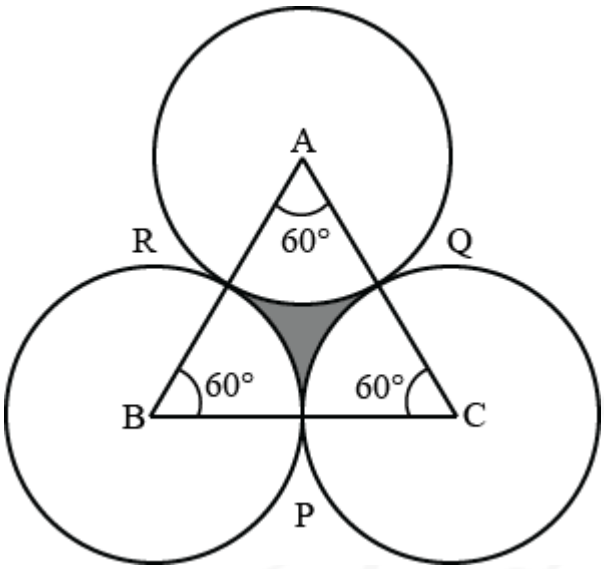
A. $\frac{1}{13}$

B. $\frac{4}{13}$

C. $\frac{10}{13}$

D. $\frac{12}{13}$

38. The area of an equilateral ΔABC is 17320.5 cm^2. A circle is drawn taking the vertex of the triangle as centre. The radius of the circle is half the length of the side of triangle. Find the area of the shaded region (in cm^2) . (π = 3.14 , $\sqrt{3}$ =1.73205)



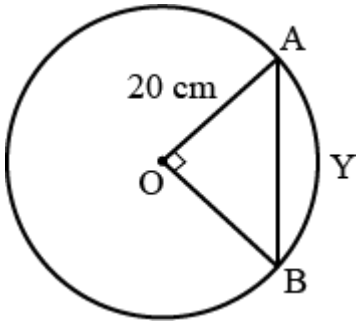
A. 1320.5 cm^2

B. 1650.0 cm^2

C. 1620.5 cm^2

D. 1220.5 cm^2

39. In a circle of radius 20 cm, a chord subtends a right angle at the centre. Find the area of the major segment: (use $\pi = \frac{22}{7}$)



A. 2635.6 cm^2

B. 1391.9 cm^2

C. 1125.2 cm^2

D. 1142.85 cm^2

40. If (2,2) lies on $4x + 5y = k$, the value of k = _____.

A. 14

B. 16

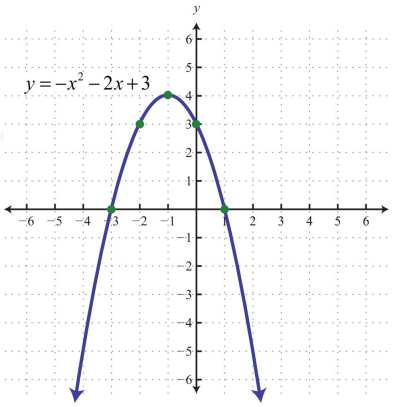
C. 17

D. 18

41.  

The above picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

Based on the above information, answer the following questions.



In the above graph, how many zeroes are there for the polynomial $x^2 - 2x + 3$?

A. 0

B. 1

C. 2

D. 3

42.  

The above picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

Based on the above information, answer the following questions.

If α, β are the zeroes of the polynomial $x^2 - px + 36$ and $\alpha^2+\beta^2$ = 9, then what is the value of p?

A. ±6

B. ±7

C. ±8

D. ±9

43.  

The above picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

Based on the above information, answer the following questions.

The product of zeroes of a cubic polynomial $x^3 - 3x^2 - x + 5$ is _____.

A. 5

B. -5

C. 3

D. -3

44.  

The above picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

Based on the above information, answer the following questions.

Find a quadratic polynomial with $\frac{1}{8}$ as the sum and 2 as product of its zeroes.

A. $8x^2 + x + 16$

B. $8x^2 - x + 16$

C. $8x^2 - x - 16$

D. $8x^2 + x - 16$

45.  

The above picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.

Based on the above information, answer the following questions.

If α and β are the zeros of polynomial $x^2 + 3x - 2$, find $\frac{1}{(\alpha)^3} + \frac{1}{(\beta)^3}$.

A. $\frac{8}{45}$

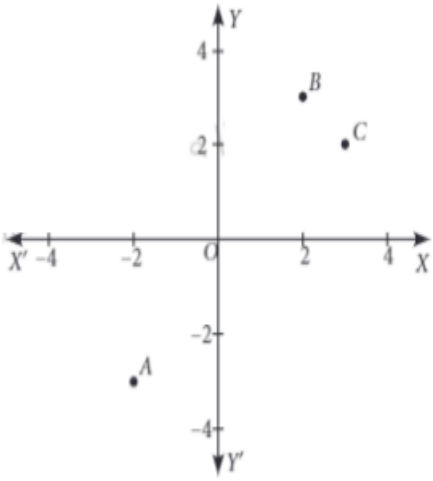
B. $\frac{-8}{45}$

C. $\frac{45}{8}$

D. $\frac{45}{8}$

46. There are two routes to travel from the place A to B by bus. The first bus reaches the place B via C and the second bus reaches the place B from A directly. The position of A, B and C are represented in the following graph.

Scale : x-axis : 1 unit = 1 km
y-axis : 1 unit = 1 km



Based on the above information, answer the following questions.

From the given graph, find the coordinates of the place C.

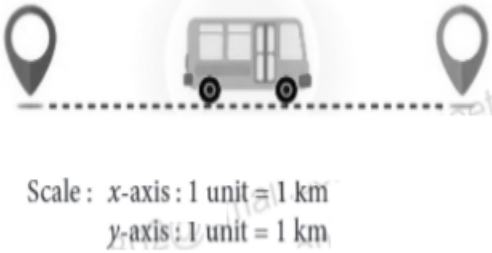
A. (2, 3)

B. (3, 2)

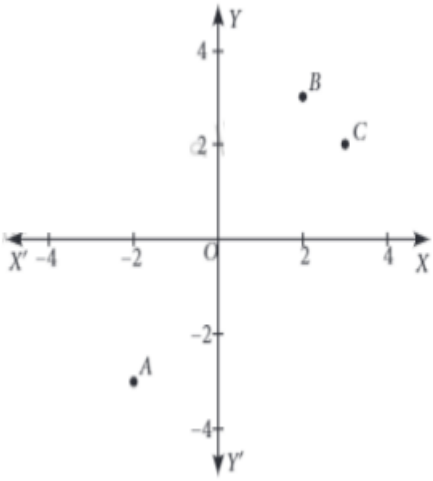
C. (-2, -3)

D. (-3, -2)

47. There are two routes to travel from the place A to B by bus. The first bus reaches the place B via C and the second bus reaches the place B from A directly. The position of A, B and C are represented in the following graph.



Scale : x-axis : 1 unit = 1 km
y-axis : 1 unit = 1 km



Based on the above information, answer the following questions.

The distance between A and B is _____.

A. 13 km

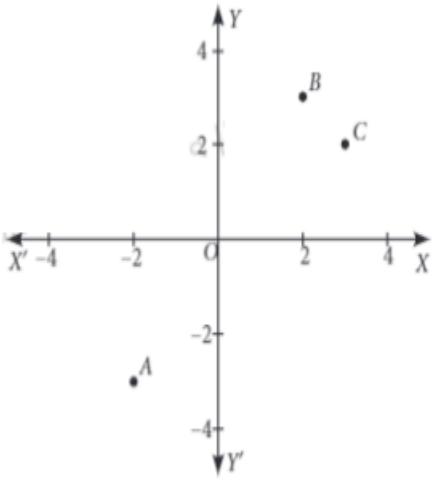
B. 26 km

C. $\sqrt{13}$ km

D. $2\sqrt{13}$ km

48. There are two routes to travel from the place A to B by bus. The first bus reaches the place B via C and the second bus reaches the place B from A directly. The position of A, B and C are represented in the following graph.

Scale : x-axis : 1 unit = 1 km
y-axis : 1 unit = 1 km



Based on the above information, answer the following questions.

Suppose if C is the place on the y-axis which is equidistant from the places A(-5,-2) and B(3, 2), then CA = ___ km.

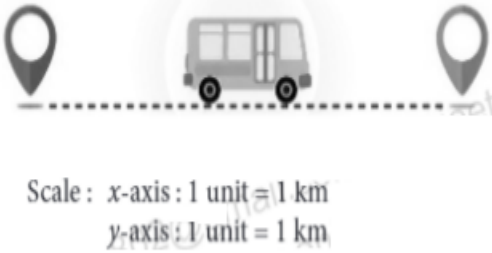
A. 5

B. 4

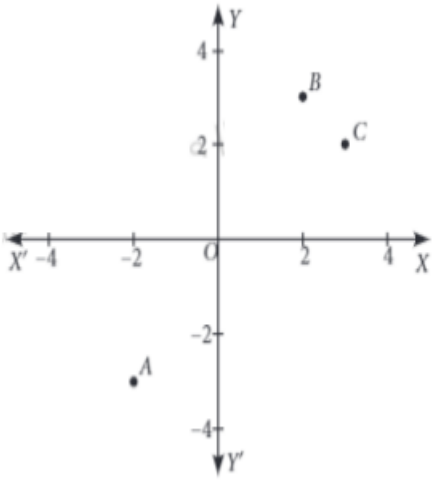
C. 3

D. 2

49. There are two routes to travel from the place A to B by bus. The first bus reaches the place B via C and the second bus reaches the place B from A directly. The position of A, B and C are represented in the following graph.



Scale : x-axis : 1 unit = 1 km
y-axis : 1 unit = 1 km



Based on the above information, answer the following questions.

If the fare for second bus is Rs. 15 per km, then what will be the fare to reach the destination by bus? (Assume $\sqrt{13} = 3.6$)

A. Rs. 105

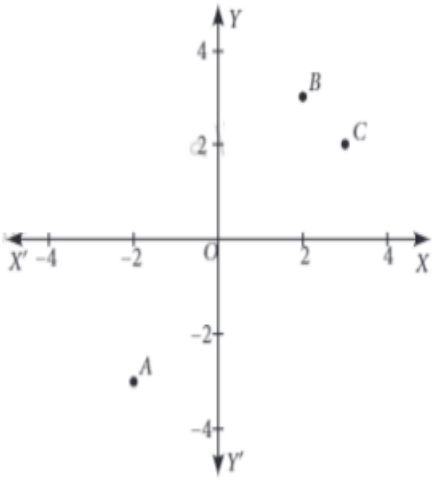
B. Rs. 108

C. Rs. 110

D. Rs. 115

50. There are two routes to travel from the place A to B by bus. The first bus reaches the place B via C and the second bus reaches the place B from A directly. The position of A, B and C are represented in the following graph.

Scale : x-axis : 1 unit = 1 km
y-axis : 1 unit = 1 km



Based on the above information, answer the following questions.

If the places A, B and C lies on the x axis such that the coordinates are (-2, 0), (2, 0) and (3,0) respectively, then find the distance between the points A and C.

A. 2 km

B. 3 km

C. 4 km

D. 5 km