1. An error 2% in excess is made while measuring the side of a square. What is the percentage of error in the calculated area of the square?

A. 4.04 %

B. 2.02 %

C. 4 %

D. 2 %

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Error = 2% while measuring the side of a square.

Let the correct value of the side of the square = 100

$$\text{Then the measured value} = 100 \times \frac{(100+2)}{100} = 102 \ (\because \text{error 2\% in excess})$$

Correct Value of the area of the square = 100 × 100 = 10000

Calculated Value of the area of the square = 102 × 102 = 10404

Error = 10404 - 10000 = 404

$$\text{Percentage Error} = \frac{\text{Error}}{\text{Actual Value}} \times 100 = \frac{404}{10000} \times 100 = 4.04\%$$

2. A rectangular park 60 m long and 40 m wide has two concrete crossroads running in the middle of the park and rest of the park has been used as a lawn. The area of the lawn is 2109 sq. m. what is the width of the road?

A. 5 m

B. 4 m

C. 2 m

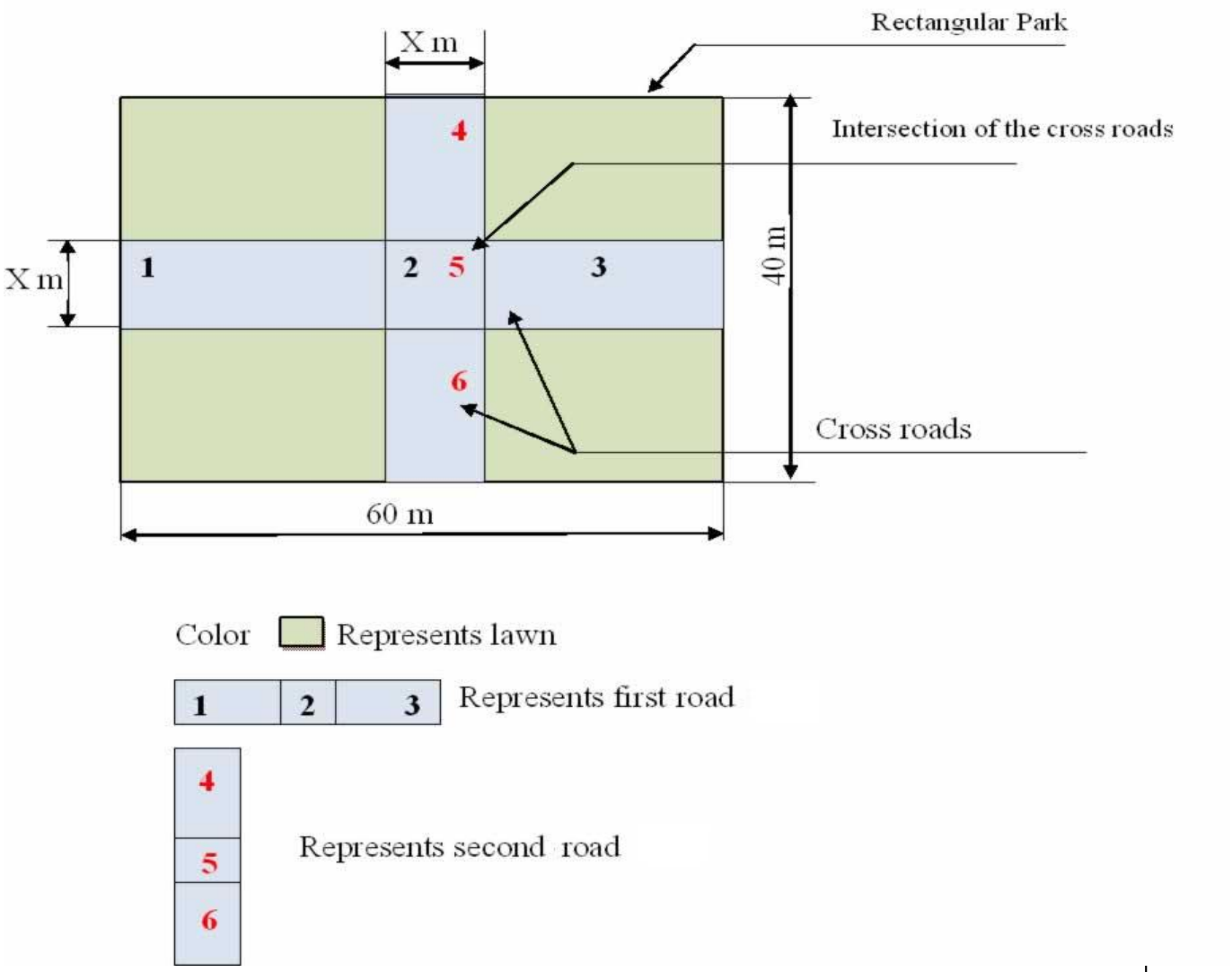
D. 3 m

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :



Please refer the diagram given above.

Area of the park = 60 × 40 = 2400 m^2

Given that area of the lawn = 2109 m^2

∴ Area of the cross roads = 2400 - 2109 = 291 m^2

Assume that the width of the cross roads = x

Then total area of the cross roads
= Area of road 1 + area of road 2 - (Common Area of the cross roads)
= 60x + 40x - x^2

(Let's look in detail how we got the total area of the cross roads as 60x + 40x - x^2
As shown in the diagram, area of the road 1 = 60x. This has the areas of the parts 1,2 and 3 given in the diagram

Area of the road 2 = 40x. This has the parts 4, 5 and 6

You can see that there is an area which is intersecting (i.e. part 2 and part 5) and the intersection area = x^2.

Since 60x + 40x covers the intersecting area (x^2) two times (part 2 and part 5) ,we need to subtract the intersecting area of (x^2) once time to get the total area. . Hence total area of the cross roads = 60x + 40x - x^2)

Now, we have

Total areas of cross roads = $60x + 40x - x^2$

But area of the cross roads = 291 m^2

Hence $60x + 40x - x^2 = 291$

$=> 100x - x^2 = 291$

$=> x^2 - 100x + 291 = 0$

$=> (x - 97)(x - 3) = 0$

=> x = 3 *(x can not be 97 as the park is only 60 m long and 40 m wide)*

3. A towel, when bleached, lost 20% of its length and 10% of its breadth. What is the percentage of decrease in area?

A. 30 %

B. 28 %

C. 32 %

D. 26 %

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Solution 1

Let original length = 100 and original breadth = 100

Then original area = 100 × 100 = 10000

Lost 20% of length

$$\Rightarrow \text{New length} = \text{Original length} \times \frac{(100-20)}{100} = 100 \times \frac{80}{100} = 80$$

Lost 10% of breadth

$$\Rightarrow \text{New breadth} = \text{Original breadth} \times \frac{(100-10)}{100} = 100 \times \frac{90}{100} = 90$$

New area = 80 × 90 = 7200

Decrease in area = Original Area - New Area = 10000 - 7200 = 2800

$$\text{Percentage of decrease in area} = \frac{\text{Decrease in Area}}{\text{Original Area}} \times 100 = \frac{2800}{10000} \times 100 = 28\%$$

Solution 2

Let original length = l and original breadth = b

Then original area = lb

Lost 20% of length

$$\Rightarrow \text{New length} = \text{Original length} \times \frac{(100-20)}{100} = l \times \frac{80}{100} = \frac{80l}{100}$$

Lost 10% of breadth

$$\Rightarrow \text{New breadth} = \text{Original breadth} \times \frac{(100-10)}{100} = b \times \frac{90}{100} = \frac{90b}{100}$$

$$\text{New area} = \frac{80l}{100} \times \frac{90b}{100} = \frac{7200lb}{10000} = \frac{72lb}{100}$$

$$\text{Decrease in area} = \text{Original Area} - \text{New Area} = lb - \frac{72lb}{100} = \frac{28lb}{100}$$

$$\text{Percentage of decrease in area} = \frac{\text{Decrease in Area}}{\text{Original Area}} \times 100$$

$$= \frac{(\frac{28lb}{100})}{lb} \times 100 = \frac{28lb \times 100}{100lb} = 28\%$$

4. If the length of a rectangle is halved and its breadth is tripled, what is the percentage change in its area?

A. 25 % Increase

B. 25 % Decrease

C. 50 % Decrease

D. 50 % Increase

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Solution 1

Let original length = 100 and original breadth = 100

Then original area = 100 × 100 = 10000

Length of the rectangle is halved

$\Rightarrow$ New length $= \frac{\text{Original length}}{2} = \frac{100}{2} = 50$

breadth is tripled

$\Rightarrow$ New breadth= Original breadth $\times$ 3 = 100 $\times$ 3 = 300

New area = 50 × 300 = 15000

Increase in area = New Area - Original Area = 15000 - 10000= 5000

Percentage of Increase in area $= \frac{\text{Increase in Area}}{\text{Original Area}} \times 100 = \frac{5000}{10000} \times 100 = 50\%$

Solution 2

Let original length = l and original breadth = b

Then original area = lb

Length of the rectangle is halved

$\Rightarrow$ New length $= \frac{\text{Original length}}{2} = \frac{l}{2}$

breadth is tripled

$\Rightarrow$ New breadth = Original breadth $\times$ 3 = 3b

New area $= \frac{l}{2} \times 3b = \frac{3lb}{2}$

Increase in area = New Area - Original Area $= \frac{3lb}{2} - lb = \frac{lb}{2}$

Percentage of Increase in area $= \frac{\text{Increase in Area}}{\text{Original Area}} \times 100$

$= \frac{(\frac{lb}{2})}{lb} \times 100 = \frac{lb \times 100}{2lb} = 50\%$

5. A person walked diagonally across a square plot. Approximately, what was the percent saved by not walking along the edges?

A. 35%

B. 30 %

C. 20 %

D. 25%

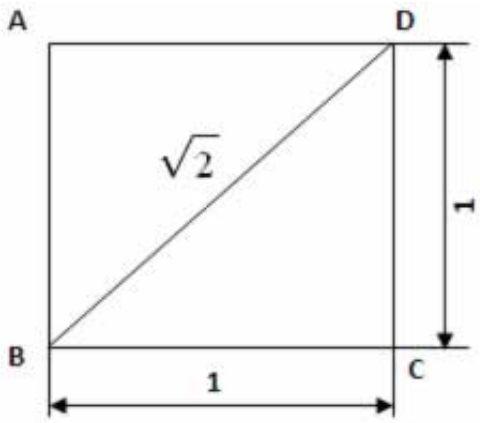
Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Solution 1



Consider a square plot as shown above and let the length of each side = 1

Then length of the diagonal $= \sqrt{(1+1)} = \sqrt{2}$

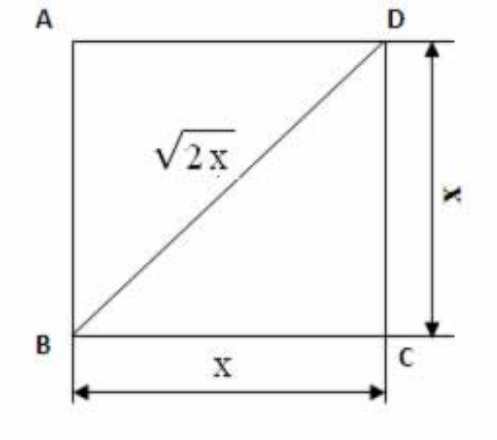
Distance travelled if walked along the edges = BC + CD = 1 + 1 = 2

Distance travelled if walked diagonally $= BD = \sqrt{2} = 1.41$

Distance Saved = 2 - 1.41 = .59

Percent distance saved $= \frac{.59}{2} \times 100 = .59 \times 50 \approx 30\%$

Solution 2



Consider a square plot as shown above and let the length of each side = x

Then length of the diagonal = $\sqrt{(x + x)} = \sqrt{2x}$

Distance travelled if walked along the edges = BC + CD = x + x = 2x

Distance travelled if walked diagonally = BD = $\sqrt{2x} = 1.41x$

Distance Saved = 2x - 1.41x = .59x

Percent distance saved = $\frac{.59x}{2x} \times 100 = .59 \times 50 \approx 30\%$

6. A rectangular field has to be fenced on three sides leaving a side of 20 feet uncovered. If the area of the field is 680 sq. feet, how many feet of fencing will be required?

A. 95
B. 92
C. 88
D. 82

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Given that area of the field = 680 sq. feet
=> lb = 680 sq. feet

Length(l) = 20 feet

=> 20 × b = 680

$\Rightarrow b = \frac{680}{20} = 34$ feet

Required length of the fencing = l + 2b = 20 + (2 × 34) = 88 feet

7. A rectangular parking space is marked out by painting three of its sides. If the length of the unpainted side is 9 feet, and the sum of the lengths of the painted sides is 37 feet, find out the area of the parking space in square feet?

A. 126 sq. ft.
B. 64 sq. ft.
C. 100 sq. ft.
D. 102 sq. ft.

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Let l = 9 ft.

Then l + 2b = 37
=> 2b = 37 - l = 37 - 9 = 28
=> b = $^{28}/_{2}$ = 14 ft.

Area = lb = 9 × 14 = 126 sq. ft.

8. The area of a rectangle plot is 460 square metres. If the length is 15% more than the breadth, what is the breadth of the plot?

A. 14 metres
B. 20 metres
C. 18 metres
D. 12 metres

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

lb = 460 m^2 ------(Equation 1)

Let the breadth = b

Then length, $l = b \times \frac{(100+15)}{100} = \frac{115b}{100}$ ------(Equation 2)

From Equation 1 and Equation 2,

$\frac{115b}{100} \times b = 460$

$b^2 = \frac{46000}{115} = 400$

$\Rightarrow b = \sqrt{400} = 20$ m

9. A large field of 700 hectares is divided into two parts. The difference of the areas of the two parts is one-fifth of the average of the two areas. What is the area of the smaller part in hectares?

A. 400

B. 365

C. 385

D. 315

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Let the areas of the parts be x hectares and (700 - x) hectares.

Difference of the areas of the two parts = x - (700 - x) = 2x - 700

one-fifth of the Average of the two areas = $\frac{1}{5} \frac{[x + (700 - x)]}{2}$

$= \frac{1}{5} \times \frac{700}{2} = \frac{350}{5} = 70$

Given that difference of the areas of the two parts = one-fifth of the Average of the two areas

=> 2x - 700 = 70

=> 2x = 770

$\Rightarrow x = \frac{770}{2} = 385$

Hence, Area of smaller part = (700 - x) = (700 – 385) = 315 hectares.

10. The length of a room is 5.5 m and width is 3.75 m. What is the cost of paying the floor by slabs at the rate of Rs. 800 per sq. metre.

A. Rs.12000

B. Rs.19500

C. Rs.18000

D. Rs.16500.

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Area = 5.5 × 3.75 sq. metre.
Cost for 1 sq. metre. = Rs. 800

Hence total cost = 5.5 × 3.75 × 800 = 5.5 × 3000 = Rs. 16500

11. The length of a rectangle is twice its breadth. If its length is decreased by 5 cm and breadth is increased by 5 cm, the area of the rectangle is increased by 75 sq.cm. What is the length of the rectangle?

A. 18 cm
B. 16 cm
C. 40 cm
D. 20 cm

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Let breadth = x cm
Then length = 2x cm
Area = lb = x × 2x = $2x^2$

New length = (2x - 5)
New breadth = (x + 5)
New Area = lb = (2x - 5)(x + 5)

But given that new area = initial area + 75 sq.cm.
=> (2x - 5)(x + 5) = $2x^2$ + 75
=> $2x^2$ + 10x - 5x - 25 = $2x^2$ + 75
=> 5x - 25 = 75
=> 5x = 75 + 25 = 100
=> x = $^{100}/_{5}$ = 20 cm

Length = 2x = 2 × 20 = 40cm

12. If a square and a rhombus stand on the same base, then what is the ratio of the areas of the square and the rhombus?

A. equal to ½
B. equal to ¾
C. greater than 1
D. equal to 1

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

A square and a rhombus on the same base will have equal areas.

Hence ratio of the areas of the square and the rhombus will be equal to 1 since they stand on the same base

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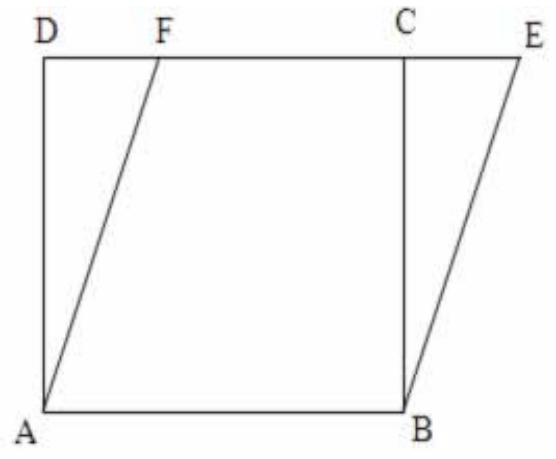
Note : Please find the proof of the formula given below which you may like to go through



Let ABCD be the square and ABEF be the rhombus

Consider the right-angled triangles ADF and BCE

We know that AD = BC (∵ sides of a square)

AF = BE (∵ sides of a rhombus)

∴ DF = CE [∵ $DF^2 = AF^2 - AD^2$ and $CE^2 = BE^2 - BC^2$]

Hence Δ ADF = Δ BCE

=> Δ ADF + Trapezium ABCF= Δ BCE + Trapezium ABCF

=> Area of square ABCD = Area of rhombus ABEF

13. The breadth of a rectangular field is 60% of its length. If the perimeter of the field is 800 m, find out the area of the field.

A. 37500 m^2

B. 30500 m^2

C. 32500 m^2

D. 40000 m^2

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Given that breadth of a rectangular field is 60% of its length

$$\Rightarrow b = \frac{60l}{100} = \frac{3l}{5}$$

perimeter of the field = 800 m

=> 2 (l + b) = 800

$$\Rightarrow 2\left(l + \frac{3l}{5}\right) = 800$$

$$\Rightarrow l + \frac{3l}{5} = 400$$

$$\Rightarrow \frac{8l}{5} = 400$$

$$\Rightarrow \frac{l}{5} = 50$$

$$\Rightarrow l = 5 \times 50 = 250 \text{ m}$$

$$b = \frac{3l}{5} = \frac{3 \times 250}{5} = 2 \times 50 = 150 \text{ m}$$

$$\text{Area} = lb = 250 \times 150 = 37500 \text{ m}^2$$

14. A room 5m 44cm long and 3m 74cm broad needs to be paved with square tiles. What will be the least number of square tiles required to cover the floor?

A. 176

B. 124

C. 224

D. 186

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

l = 5 m 44 cm = 544 cm
b = 3 m 74 cm = 374 cm
Area = 544 × 374 cm^2

Now we need to find out HCF(Highest Common Factor) of 544 and 374.
Let's find out the HCF using long division method for quicker results)

```
374) 544 (1
     374
     ---
     170) 374 (2
          340
          ---
           34) 170 (5
```

170

0

Hence, HCF of 544 and 374 = 34

Hence, side length of largest square tile we can take = 34 cm

Area of each square tile = 34 × 34 cm^2

$$\text{Number of tiles required} = \frac{544 \times 374}{34 \times 34} = 16 \times 11 = 176$$

15. The length of a rectangular plot is 20 metres more than its breadth. If the cost of fencing the plot @ Rs. 26.50 per metre is Rs. 5300, what is the length of the plot in metres?

A. 60 m

B. 100 m

C. 75 m

D. 50 m

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Length of the plot is 20 metres more than its breadth.
Hence, let's take the length as l metres and breadth as (l - 20) metres

Length of the fence = perimeter = 2(length + breadth)= 2[l + (l - 20)] = 2(2l - 20) metres
Cost per meter = Rs. 26.50
Total cost = 2(2l - 20) × 26.50

Total cost is given as Rs. 5300
=> 2(2l - 20) × 26.50 = 5300
=> (2l - 20) × 26.50 = 2650
=> (l - 10) × 26.50 = 1325
=> (l - 10) = $^{1325}/_{26.50}$ = 50
=> l = 50 + 10 = 60 metres

16. The ratio between the length and the breadth of a rectangular park is 3 : 2. If a man cycling along the boundary of the park at the speed of 12 km/hr completes one round in 8 minutes, then what is the area of the park (in sq. m)?

A. 142000

B. 112800

C. 142500 D. 153600

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

l : b = 3 : 2 ----------**(Equation 1)**

Perimeter of the rectangular park
= Distance travelled by the man at the speed of 12 km/hr in 8 minutes
= speed × time = 12 × $^{8}/_{60}$ (∵ 8 minute = $8/_{60}$ hour)
= $^{8}/_{5}$ km = $^{8}/_{5}$ ×1000 m = 1600 m

Perimeter = 2(l + b)

=> 2(l + b) = 1600
=> l + b = $^{1600}/_{2}$ = 800 m ----------**(Equation 2)**

From (Equation 1) and (Equation 2)
l = 800 × $^{3}/_{5}$ = 480 m
b = 800 × $^{2}/_{5}$ = 320 m *(Or b = 800 - 480 = 320m)*

Area = lb = 480 × 320 = 153600 m^2

17. What is the percentage increase in the area of a rectangle, if each of its sides is increased by 20%?

A. 45% B. 44%
C. 40% D. 42%

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Solution 1

Let original length = 100 and original breadth = 100
Then original area = 100 × 100 = 10000

Increase in 20% of length

$$\Rightarrow \text{New length} = \text{Original length} \times \frac{(100+20)}{100} = 100 \times \frac{120}{100} = 120$$

Increase in 20% of breadth

$$\Rightarrow \text{New breadth} = \text{Original breadth} \times \frac{(100+20)}{100} = 100 \times \frac{120}{100} = 120$$

New area = 120 × 120 = 14400

Increase in area = New Area - Original Area = 14400 - 10000 = 4400

$$\text{Percentage increase in area} = \frac{\text{Increase in Area}}{\text{Original Area}} \times 100 = \frac{4400}{10000} \times 100 = 44\%$$

Solution 2

Let original length = l and original breadth = b

Then original area = lb

Increase in 20% of length

$$\Rightarrow \text{New length} = \text{Original length} \times \frac{(100+20)}{100} = l \times \frac{120}{100} = \frac{120l}{100}$$

Increase in 20% of breadth

$$\Rightarrow \text{New breadth} = \text{Original breadth} \times \frac{(100+20)}{100} = b \times \frac{120}{100} = \frac{120b}{100}$$

$$\text{New area} = \frac{120l}{100} \times \frac{120b}{100} = \frac{14400lb}{10000} = \frac{144lb}{100}$$

$$\text{Increase in area} = \text{New Area} - \text{Original Area} = \frac{144lb}{100} - lb = \frac{44lb}{100}$$

$$\text{Percentage of increase in area} = \frac{\text{Increase in Area}}{\text{Original Area}} \times 100$$

$$= \frac{(\frac{44lb}{100})}{lb} \times 100 = \frac{44lb \times 100}{100lb} = 44\%$$

18. If the difference between the length and breadth of a rectangle is 23 m and its perimeter is 206 m, what is its area?

A. 2800 m^2

B. 2740 m^2

C. 2520 m^2

D. 2200 m^2

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

l - b = 23 .....**(Equation 1)**

perimeter = 2(l + b) = 206
=> l + b = 103.....**(Equation 2)**

(Equation 1) + (Equation 2) => 2l = 23 + 103 = 126
=> l = $^{126}/_{2}$ = 63 metre

Substituting this value of l in (Equation 1), we get
63 - b = 23
=> b = 63 - 23 = 40 metre

Area = lb = 63 × 40 = 2520 m^2

19. The ratio between the perimeter and the breadth of a rectangle is 5 : 1. If the area of the rectangle is 216 sq. cm, what is the length of the rectangle?

A. 16 cm

B. 18 cm

C. 14 cm

D. 20 cm

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Given that $\frac{2(l+b)}{b} = 5$

=> 2l + 2b = 5b

=> 2l = 3b

$\Rightarrow b = \frac{2l}{3}$

Also given that area = 216 cm^2

=> lb = 216 cm^2

Substituting the value of b, we get, $l \times \frac{2l}{3} = 216$

$\Rightarrow l^2 = \frac{3 \times 216}{2} = 3 \times 108 = (3 \times 3) \times 36$

$\Rightarrow l = 3 \times 6 = 18$ cm

20. What is the least number of squares tiles required to pave the floor of a room 15 m 17 cm long and 9 m 2 cm broad?

A. 814

B. 802

C. 836

D. 900

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

l = 15 m 17 cm = 1517 cm
b = 9 m 2 cm = 902 cm
Area = 1517 × 902 cm^2

Now we need to find out HCF(Highest Common Factor) of 1517 and 902.
Let's find out the HCF using long division method for quicker results)

```
902)  1517  (1
       902
      ----
      615)  902  (1
             615
            ----
            287)  615 (2
                  574
                 ----
                  41)  287  (7
                       287
                      ----
                        0
```

Hence, HCF of 1517 and 902 = 41

Hence, side length of largest square tile we can take = 41 cm

Area of each square tile = 41 × 41 cm^2

$$\text{Number of tiles required} = \frac{1517 \times 902}{41 \times 41} = 37 \times 22 = 407 \times 2 = 814$$

21. The diagonal of the floor of a rectangular room is $7\frac{1}{2}$ feet. The shorter side of the room is $4\frac{1}{2}$ feet. What is the area of the room?

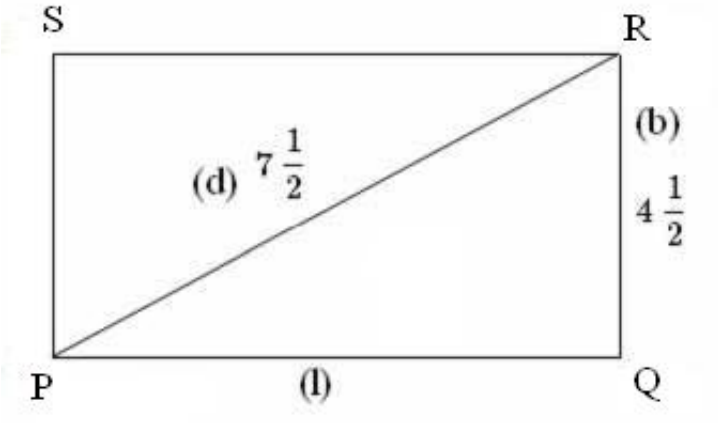
A. 27 square feet
B. 22 square feet
C. 24 square feet
D. 20 square feet

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :



Diagonal, $d = 7\frac{1}{2}$ feet $= \frac{15}{2}$ feet

Breadth, $b = 4\frac{1}{2}$ feet $= \frac{9}{2}$ feet

In the right-angled triangle PQR,

$l^2 = (\frac{15}{2})^2 - (\frac{9}{2})^2$

$= \frac{225}{4} - \frac{81}{4} = \frac{144}{4}$

$l = \sqrt{\frac{144}{4}} = \frac{12}{2}$ feet $= 6$ feet

Area $= lb = 6 \times \frac{9}{2} = 27$ feet^2

22. The diagonal of a rectangle is $\sqrt{41}$ cm and its area is 20 sq. cm. What is the perimeter of the rectangle?

A. 16 cm

B. 10 cm

C. 12 cm

D. 18 cm

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

For a rectangle, $d^2 = l^2 + b^2$
where l = length , b = breadth and d = diagonal of the of the rectangle

$d = \sqrt{41}$ cm

$d^2 = l^2 + b^2$

$\Rightarrow l^2 + b^2 = (\sqrt{41})^2 = 41$.....(Equation 1)

Area = lb = 20 cm ^{2}.....(Equation 2)

Solving (Equation 1) and (Equation 2)

$(a + b)^2 = a^2 + 2ab + b^2$

using the above formula, we have

$(l + b)^2 = l^2 + 2lb + b^2 = (l^2 + b^2) + 2lb = 41 + (2 \times 20) = 81$

$\Rightarrow (l + b) = \sqrt{81} = 9$ cm

perimeter = $2(l + b) = 2 \times 9 = 18$ cm

23. A tank is 25 m long, 12 m wide and 6 m deep. What is the cost of plastering of its walls and bottom at the rate of 75 paise per sq. m?

A. Rs. 558

B. Rs. 502

C. Rs. 516

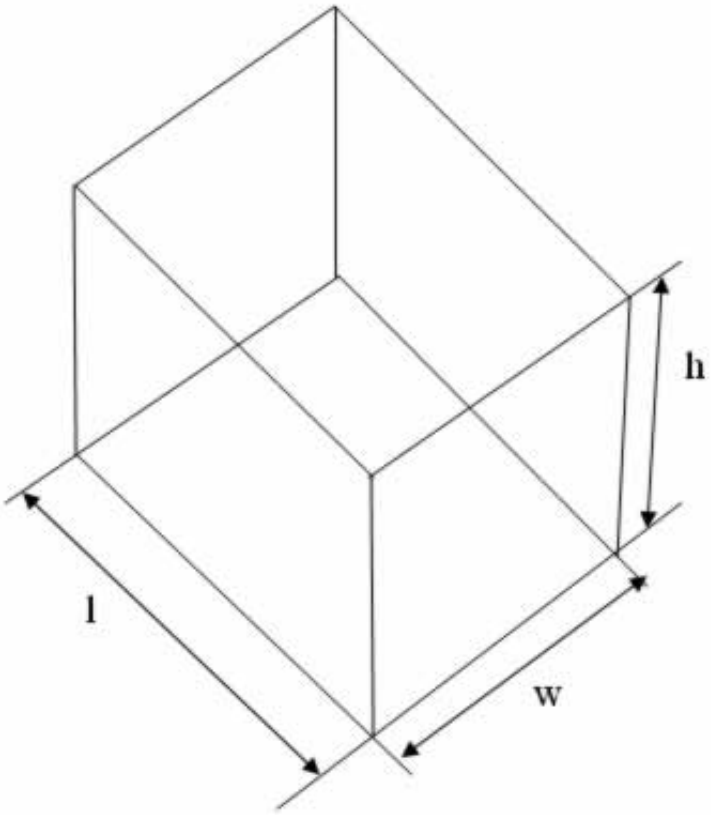
D. Rs. 612

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :



Consider a rectangular solid of length l, width w and height h. Then

1. Total Surface area of a rectangular solid, S = 2lw + 2lh + 2wh = 2(lw + lh + wh)

2. Volume of a rectangular solid, V = lwh

In this case, l = 25 m, w = 12 m, h = 6 m
and all surface needs to be plastered except the top

Hence total area needs to be plastered
= Total Surface Area - Area of the Top face
= (2lw + 2lh + 2wh) - lw
= lw + 2lh + 2wh
= (25 × 12) + (2 × 25 × 6) + (2 × 12 × 6)
= 300 + 300 + 144
= 744 m^2

Cost of plastering = 744 × 75 = 55800 paise = Rs.558

24. It is decided to construct a 2 metre broad pathway around a rectangular plot on the inside. If the area of the plots is 96 sq.m. and the rate of construction is Rs. 50 per square metre., what will be the total cost of the construction?

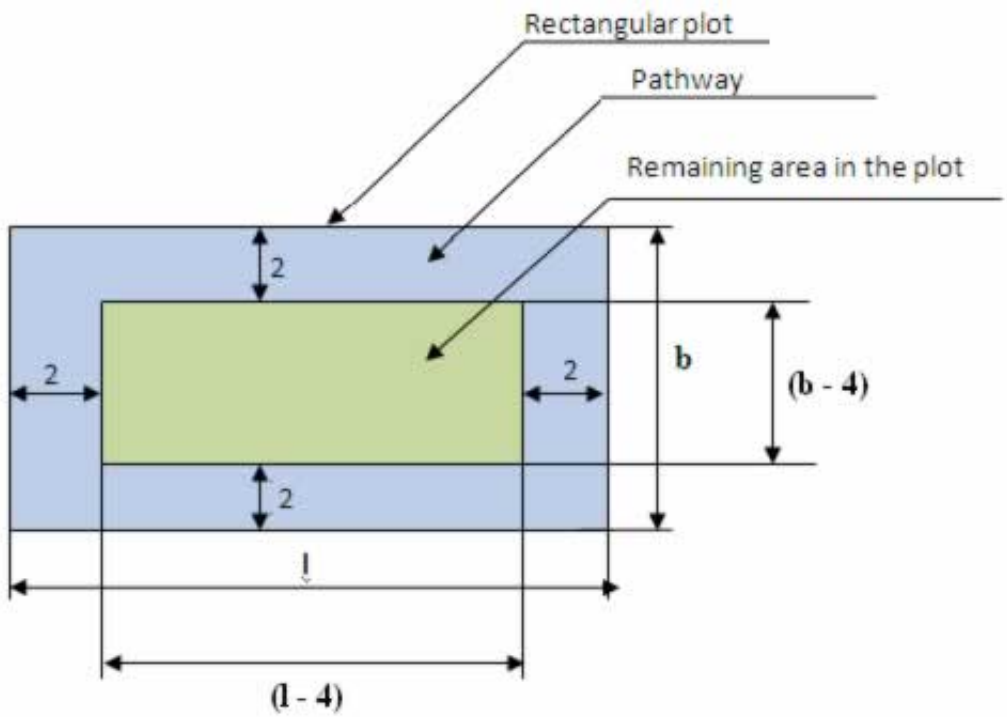
A. Rs.3500
B. Rs. 4200
C. Insufficient Data
D. Rs. 4400

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :



Let length and width of the rectangular plot be l and b respectively
Total Area of the rectangular plot = 96 sq.m.

Width of the pathway = 2 m

Length of the remaining area in the plot = (l - 4)
breadth of the remaining area in the plot = (b - 4)
Area of the remaining area in the plot = (l - 4)(b - 4)

Area of the pathway
= Total Area of the rectangular plot - remaining area in the plot
= 96 - [(l - 4)(b - 4)]
= 96 - [lb - 4l - 4b + 16]
= 96 - [96 - 4l - 4b + 16]
= 96 - 96 + 4l + 4b - 16]
= 4l + 4b - 16
= 4(l + b) - 16

We do not know the values of l and b and hence total area of the rectangular plot can not be found out. So we can not find out total cost of the construction.

25. The area of a parallelogram is 72 cm^2 and its altitude is twice the corresponding base. What is the length of the base?

A. 6 cm

B. 7 cm

C. 8 cm

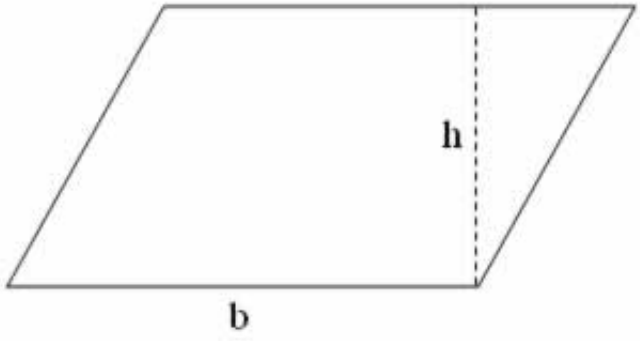
D. 12 cm

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :



Area of a parallelogram , A = bh
where b is the base and h is the height of the parallelogram

Let the base = x cm.
Then the height = 2x cm (∵ altitude is twice the base)

Area = x × 2x = $2x^2$

But the area is given as 72 cm^2

=> $2x^2 = 72$
=> $x^2 = 36$
=> x = 6 cm

26. Two diagonals of a rhombus are 72 cm and 30 cm respectively. What is its perimeter?

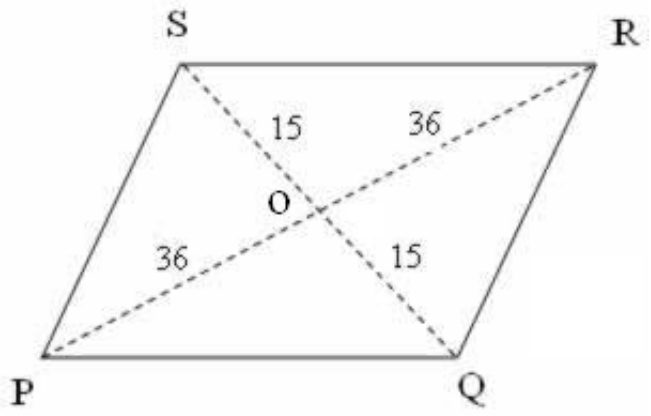
A. 136 cm
B. 156 cm
C. 144 cm
D. 121 cm

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :



Remember the following two properties of a rhombus which will be useful in solving

this question

1. The sides of a rhombus are congruent.
2. The diagonals of a rhombus are unequal and bisect each other at right angles.

Let the diagonals be PR and SQ such that PR = 72 cm and SQ = 30 cm

$$PO = OR = \frac{72}{2} = 36 \text{ cm}$$

$$SO = OQ = \frac{30}{2} = 15 \text{ cm}$$

$$PQ = QR = RS = SP = \sqrt{36^2 + 15^2} = \sqrt{1296 + 225} = \sqrt{1521} = 39 \text{ cm}$$

$$\text{perimeter} = 4 \times 39 = 156 \text{ cm}$$

27. The base of a parallelogram is (p + 4), altitude to the base is (p - 3) and the area is (p^2 - 4), find out its actual area.

A. 40 sq. units

B. 54 sq. units

C. 36 sq. units

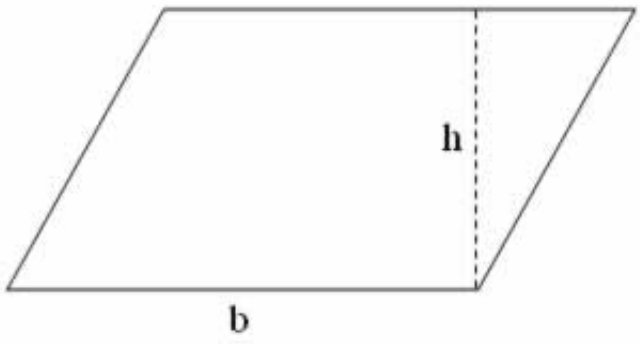
D. 60 sq. units

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :



Area of a parallelogram , A = bh
where b is the base and h is the height of the parallelogram

Hence, we have

$p^2 - 4 = (p + 4)(p - 3)$

$\Rightarrow p^2 - 4 = p^2 - 3p + 4p - 12$

$\Rightarrow -4 = p - 12$

$\Rightarrow p = 12 - 4 = 8$

Hence, actual area = $(p^2 - 4) = 8^2 - 4 = 64 - 4 = 60$ sq. units

28. A circle is inscribed in an equilateral triangle of side 24 cm, touching its sides. What is the area of the remaining portion of the triangle?

A. $144\sqrt{3} - 48\pi$ cm^2

B. $121\sqrt{3} - 36\pi$ cm^2

C. $144\sqrt{3} - 36\pi$ cm^2

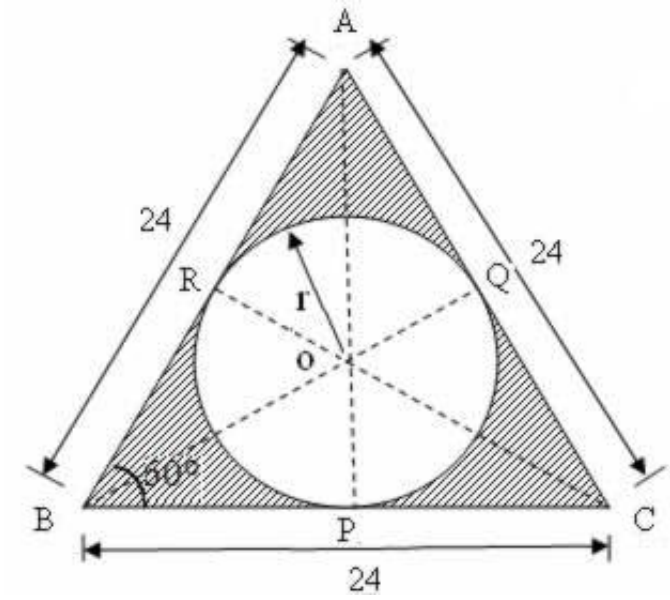
D. $121\sqrt{3} - 48\pi$ cm^2

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :



Area of an equilateral triangle = $\frac{\sqrt{3}}{4} a^2$

where a is length of one side of the equilateral triangle

Area of the equilateral Δ ABC = $\frac{\sqrt{3}}{4} a^2 = \frac{\sqrt{3}}{4} 24^2 = 144\sqrt{3}$ cm^2.....(1)

Area of a triangle = $\frac{1}{2}$ bh

where b is the base and h is the height of the triangle

Let r = radius of the inscribed circle. Then

Area of Δ ABC

= Area of Δ OBC + Area of Δ OCA + area of Δ OAB

= (½ × r × BC) + (½ × r × CA) + (½ × r × AB)

= ½ × r × (BC + CA + AB)

= ½ x r x (24 + 24 + 24)

= ½ x r x 72 = 36r cm2 ---------- (2)

From (1) and (2),

$144\sqrt{3} = 36r$

$\Rightarrow r = \frac{144}{36}\sqrt{3} = 4\sqrt{3} - - - - - - - - - - - - - (3)$

Area of a circle = πr^2
where = radius of the circle

From (3), the area of the inscribed circle = $\pi r^2 = \pi(4\sqrt{3})^2 = 48\pi - - - - - - - - - - - - - (4)$

Hence , Area of the remaining portion of the triangle

Area of Δ ABC – Area of inscribed circle

$144\sqrt{3} - 48\pi$ cm^2

29. A rectangular plot measuring 90 metres by 50 metres needs to be enclosed by wire fencing such that poles of the fence will be kept 5 metres apart. How many poles will be needed?

A. 30
B. 44
C. 56
D. 60

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Perimeter of a rectangle = 2(l + b)
where l is the length and b is the breadth of the rectangle

Length of the wire fencing = perimeter = 2(90 + 50) = 280 metres

Two poles will be kept 5 metres apart. Also remember that the poles will be placed

along the perimeter of the rectangular plot, not in a single straight line which is very important.

Hence number of poles required = $^{280}/_{5}$ = 56

30. If the diagonals of a rhombus are 24 cm and 10 cm, what will be its perimeter

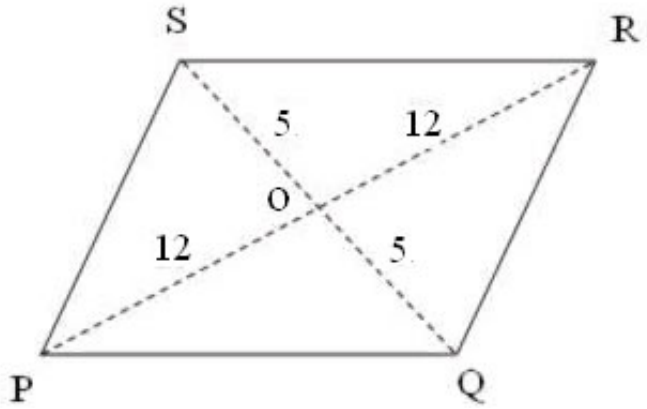
A. 42 cm
B. 64 cm
C. 56 cm
D. 52 cm

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :



Let the diagonals be PR and SQ such that PR = 24 cm and SQ = 10 cm

$$PO = OR = \frac{24}{2} = 12 \text{ cm}$$

$$SO = OQ = \frac{10}{2} = 5 \text{ cm}$$

$$PQ = QR = RS = SP = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = 13 \text{ cm}$$

$$\text{perimeter} = 4 \times 13 = 52 \text{ cm}$$

31. What will be the length of the longest rod which can be placed in a box of 80 cm length, 40 cm breadth and 60 cm height?

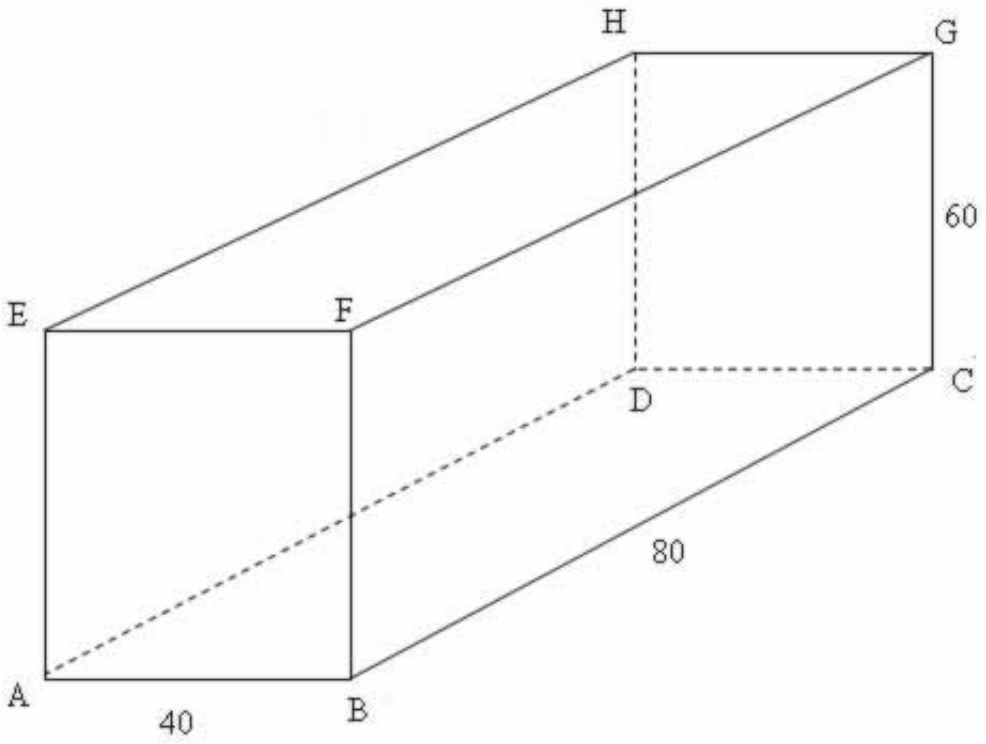
A. $\sqrt{11600}$ cm
B. $\sqrt{14400}$ cm
C. $\sqrt{10000}$ cm
D. $\sqrt{12040}$ cm

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

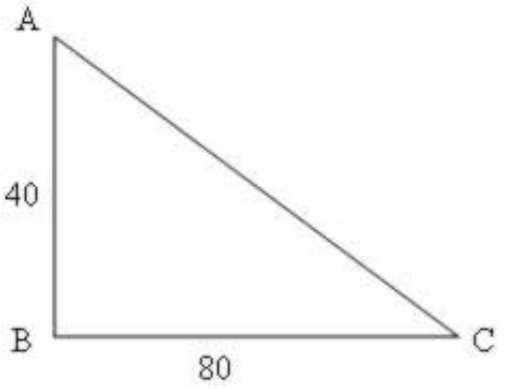
Explanation :



The longest road which can fit into the box will have one end at A and other end at G (or any other similar diagonal)

Hence the length of the longest rod = AG

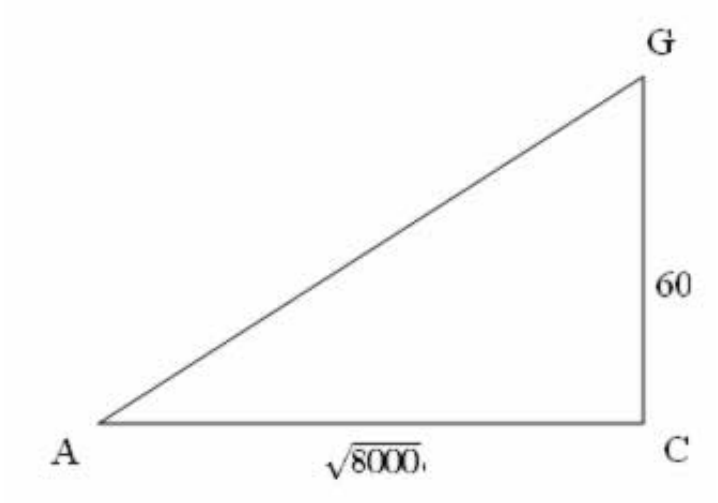
Initially let's find out AC. Consider the right angled triangle ABC



$AC^2 = AB^2 + BC^2 = 40^2 + 80^2 = 1600 + 6400 = 8000$

$\Rightarrow AC = \sqrt{8000}$ cm

Consider the right angled triangle ACG



$AG^2 = AC^2 + CG^2$

$= (\sqrt{8000})^2 + 60^2 = 8000 + 3600 = 11600$

$\Rightarrow$ AG = $\sqrt{11600}$ cm

$\Rightarrow$ The length of the longest rod = $\sqrt{11600}$ cm