

**Q1: Evaluate**  $\left(\frac{\sqrt{0.09} - \sqrt{0.01}}{\sqrt{0.09} + \sqrt{0.01}}\right)(\sqrt{4} \times \sqrt{16})$

- A) 2    B) 3    **✓C) 4**    D) 5

**Solution:**

$$\left(\frac{0.3 - 0.1}{0.3 + 0.1}\right)(2 \times 4) = \frac{0.2}{0.4} \times 8 = \frac{1}{2} \times 8 = 4$$

**Answer: C**

**Q2: Find the value of  $h$  in the equation**

$$12\frac{1}{5} = h + 7\frac{4}{5}$$

- A)  $\frac{19}{5}$     **✓B)  $\frac{22}{5}$**     C)  $\frac{27}{5}$     D)  $\frac{33}{5}$

**Solution:**

$$12\frac{1}{5} = h + 7\frac{4}{5} \Rightarrow 12\frac{1}{5} - 7\frac{4}{5} = h \Rightarrow$$

$$h = \frac{61 - 39}{5} = \frac{22}{5}$$

**Answer: B**

**Q3: Age of a father is 42 and his son is 12 years old. After how many years the age of father will be triple of his son**

- A) 4    **✓B) 3**    C) 2    D) 1

**Solution:**

$$3(x + 12) = 42 + x \Rightarrow 3x + 36 = 42 + x \Rightarrow$$

$$3x - x = 42 - 36 \Rightarrow 2x = 6 \Rightarrow x = 3$$

**Answer: B**

**Q4: Evaluate**  $\frac{0.00a}{0.0a} + \frac{0.bc}{b.c} - \frac{a.bc}{abc}$

- A) 1.9    B) 1.9ab    **✓C) 0.19**    D) 0.19abc

**Solution:**

$$\frac{0.00a}{0.0a} + \frac{0.bc}{b.c} - \frac{a.bc}{abc} = \frac{\cancel{a}}{10\cancel{a}} + \frac{\cancel{b}\cancel{c}}{10\cancel{b}\cancel{c}} - \frac{\cancel{a}\cancel{b}\cancel{c}}{100\cancel{a}\cancel{b}\cancel{c}}$$

$$\frac{1}{10} + \frac{1}{10} - \frac{1}{100} = 0.1 + 0.1 - 0.01 = 0.2 - 0.01 = 0.19$$

**Answer: C**

**Q5: Which of the following is not a factor of  $ax^2 - a^2x - abx + bx^2$**

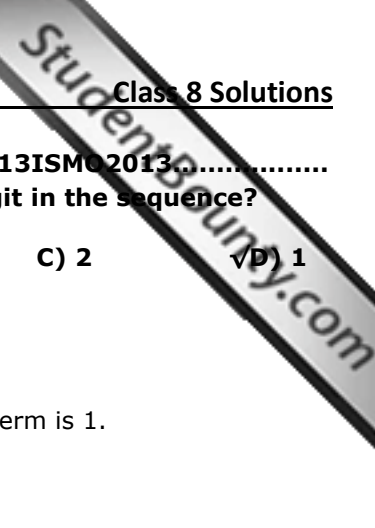
- A)  $x$     **✓B)  $x - b$**     C)  $a + b$     D)  $x - a$

**Solution:**

$$ax^2 - a^2x - abx + bx^2 = ax(x - a) + bx(x - a)$$

$$x(x - a)(a + b) \text{ then answer: } (x - b)$$

**Answer: B**



**Q6:** Find the multiplicative inverse of  $a$  if

$$\frac{\left(1 + \frac{1}{2}\right) \cdot \left(1 + \frac{1}{3}\right) \cdot \left(1 + \frac{1}{4}\right) \dots \left(1 + \frac{1}{18}\right)}{\left(1 - \frac{1}{2}\right) \cdot \left(1 - \frac{1}{3}\right) \cdot \left(1 - \frac{1}{4}\right) \dots \left(1 - \frac{1}{8}\right)} = a$$

- A) 76      √B) 1/76      C) 1/78      D) 78

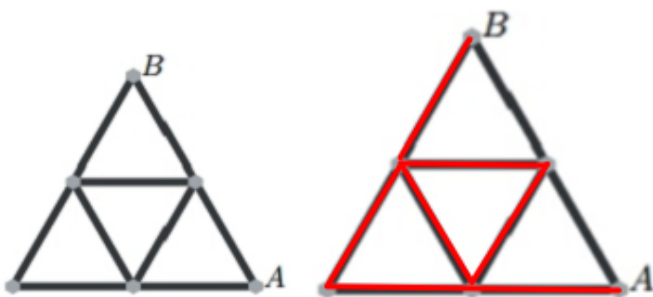
$$\frac{\left(1 + \frac{1}{2}\right) \cdot \left(1 + \frac{1}{3}\right) \cdot \left(1 + \frac{1}{4}\right) \dots \left(1 + \frac{1}{18}\right)}{\left(1 - \frac{1}{2}\right) \cdot \left(1 - \frac{1}{3}\right) \cdot \left(1 - \frac{1}{4}\right) \dots \left(1 - \frac{1}{8}\right)} = a$$

**Solution:**  $\frac{\cancel{2} \cdot \cancel{4} \cdot \cancel{6} \dots 19}{2 \cdot \cancel{3} \cdot \cancel{4} \dots \cancel{18}} = \frac{19}{\cancel{2} \cdot \cancel{3} \cdot \cancel{4} \dots \cancel{8}} = \frac{19}{\cancel{2} \cdot \cancel{3} \cdot \cancel{4} \dots \cancel{8}} = 19 \times 4 = 76 = a$

$$\frac{1}{a} = \frac{1}{76}$$

**Answer: B**

**Q7:** Each of the nine paths in a park is 100 m long. Ann wants to go from A to B without going along any path more than once. What is the length of the longest route she can choose?



- A) 900m      B) 800m  
√C) 700m      D) 600m

**Solution:**

**Answer: C**

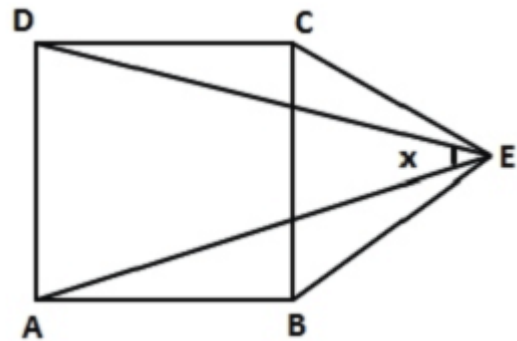
**Q8:** ISMO2013ISMO2013ISMO2013..... find the 767<sup>th</sup> letter or digit in the sequence?

- A) I      B) M      C) 2      √D) 1

**Solution:**  $8 \overline{) 767} \begin{array}{r} 95 \\ 72 \\ \hline 047 \\ -40 \\ \hline \times \times 7 \end{array}$  and 7th term is 1.

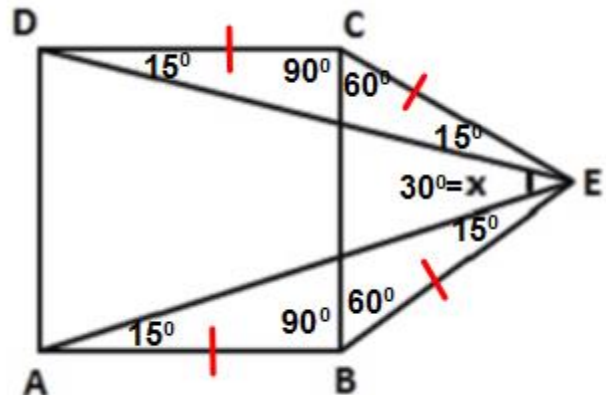
**Answer: D**

**Q9:** ABCD is a square and ΔBCE is an equilateral triangle. Find  $x^\circ$



- A) 15      √B) 30      C) 45      D) 60

**Solution:**



**Answer: B**



**Q16: Evaluate**  $\left(2\frac{1}{4}\right)^{-1} \cdot \left(\frac{1}{1+\frac{1}{3}} + \frac{1}{1-\frac{1}{3}}\right)$

- A) 4                  B) 3                  C) 2                  **√D) 1**

**Solution:**

$$\left(2\frac{1}{4}\right)^{-1} \cdot \left(\frac{1}{1+\frac{1}{3}} + \frac{1}{1-\frac{1}{3}}\right) = \left(\frac{9}{4}\right)^{-1} \cdot \left(\frac{1}{\frac{4}{3}} + \frac{1}{\frac{2}{3}}\right)$$

$$\frac{4}{9} \cdot \left(\frac{3}{4} + \frac{3}{2}\right) = \frac{4}{9} \cdot \frac{9}{4} = 1$$

**Answer: D**

**Q17: If**  $1+2+3 = \frac{3 \times 4}{2}$  **and**  $1+2+3+4+5 = \frac{5 \times 6}{2}$

**the,**  $1+2+3+\dots+n=?$

- A)  $n(n+1)$                                   **√B)  $\frac{n(n+1)}{2}$**   
 C)  $2n(n+1)$                                 D)  $n(2n+1)$

**Solution:**  $1+2+3+\dots+n = \frac{n(n+1)}{2}$

**Answer: B**

**Q18: If**  $-12 < n+4 < 24$ , **then find the maximum and minimum value of n? (n is an integer)**

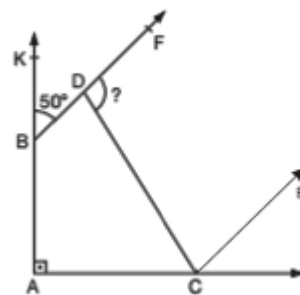
- √A) 19 and -15**                                **B) 20 and -16**  
**C) 19 and -16**                                **D) 21 and -15**

$$-12 < n+4 < 24 \Rightarrow$$

**Solution:**  $-12 < n+4 \Rightarrow -16 < n \Rightarrow \min n = -15$

$$n+4 < 24 \Rightarrow n < 20 \Rightarrow \max n = 19$$

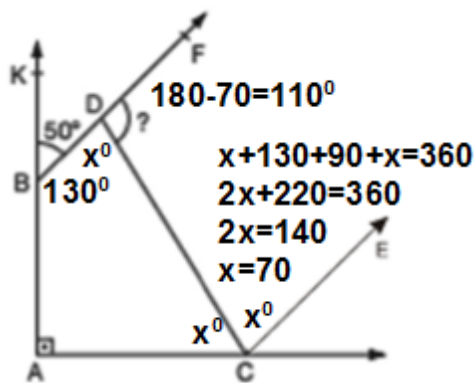
**Q19: If**  $[AK \perp [AC, [BF \parallel [CE$  and  $m\angle(ACD) = m\angle(DCE), m\angle(FKB) = 50^\circ$  then,



$m\angle(FDC) = ?$

- √A) 110°**                  B) 120°                  C) 130°                  D) 140°

**Solution:**



**Answer: A**

**Q20: Evaluate**  $1-3+5-7+9-11+\dots+49=?$

- A) -25                  B) -24                  C) 24                  **√D) 25**

**Solution:**

$$1-3+5-7+9-11+\dots+49=?$$

$$-2-2-2+\dots-2+49=?$$

$$-2 \times 12 + 49 = -24 + 49 = 25$$

**Answer: D**

**Q21:** If  $\frac{\sqrt{7}-8}{\sqrt{5}-2} = a$  then, which of the followings

is the result of  $\frac{\sqrt{7}+8}{\sqrt{5}+2}$  in terms of  $a$

- A)  $\frac{7}{a}$       B)  $\frac{8}{a}$       C)  $\frac{-49}{a}$       **√D)  $\frac{-57}{a}$**

**Solution:**

$$\frac{\sqrt{7}-8}{\sqrt{7}-8} \times \frac{\sqrt{7}+8}{\sqrt{5}+2} \times \frac{\sqrt{5}-2}{\sqrt{5}-2} = \frac{7-64}{\sqrt{7}-8} \times \frac{\sqrt{5}-2}{5-4}$$

$$\frac{-57}{1} \times \frac{\sqrt{5}-2}{\sqrt{7}-8} = -57 \times \frac{1}{a} = \frac{-57}{a}$$

**Answer: D**

**Q22:** Sibtain evaluates

$$\left( \frac{1}{x^2+y} + \frac{1}{x^2-y} \right) \cdot \frac{x^2y^2-y^3}{2xy} \text{ for } x = \frac{1}{5} \text{ and } y = \frac{1}{7}$$

Which of the following expressions has the same

value when  $x = \frac{1}{5}$  and  $y = \frac{1}{7}$

- √A)  $\frac{xy}{x^2+y}$**       B)  $\frac{x}{x^2-y}$   
 C)  $\frac{y}{x+y}$       D)  $\frac{2xy}{x-y}$

**Solution:**

$$\left( \frac{1}{x^2+y} + \frac{1}{x^2-y} \right) \cdot \frac{x^2y^2-y^3}{2xy} = \frac{x^2\cancel{y} + x^2\cancel{y}}{x^4-y^2} \cdot \frac{y^2(x^2-y)}{2xy}$$

$$\frac{\cancel{x}^{\cancel{x}}}{(x^2+y)(x^2-y)} \times \frac{y^{\cancel{y}}(\cancel{x^2-y})}{\cancel{x}\cancel{y}} = \frac{xy}{x^2+y}$$

**Answer: A**

**Q23: Information:** The numbers which can be

Example: 1+2+3=6 or 1+2+3+4+5=15

The numbers which are squares of natural numbers are called perfect squares. Which of the following numbers is neither a triangular nor a perfect square?

Example: 36 is square of 6

- A) 171      B) 300      C) 289      D) 255

**Solution:**

A)  $171 = \frac{18 \times 19}{2}$

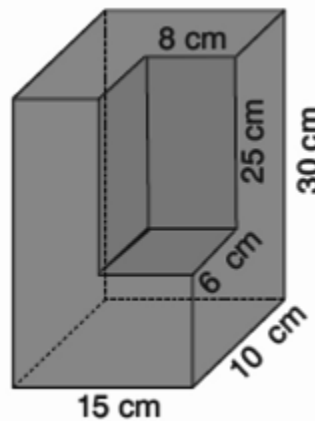
B)  $300 = \frac{24 \times 25}{2}$

C)  $289 = 17^2$

**√D) 255**

**Answer: D**

**Q24:** In the figure, a rectangular prism has been removed from a larger prism with dimensions 15 cm, 10 cm and 30 cm. Find the volume of the remaining solid in cubic centimeters



- A) 3400      B) 3350      **√C) 3300**      D) 3250

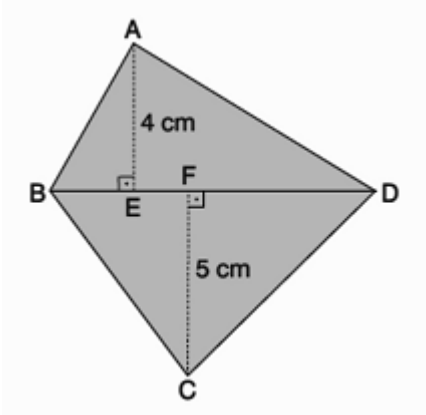
**Solution:**

$$15 \times 10 \times 30 - 8 \times 6 \times 25 =$$

$$= 4500 - 1200$$

**Answer: C**

Q25: Find the area of given figure if BD is 12 cm



- A) 20 cm<sup>2</sup>
- B) 64cm<sup>2</sup>
- √C) 54cm<sup>2</sup>
- D) 56cm<sup>2</sup>

**Solution:**

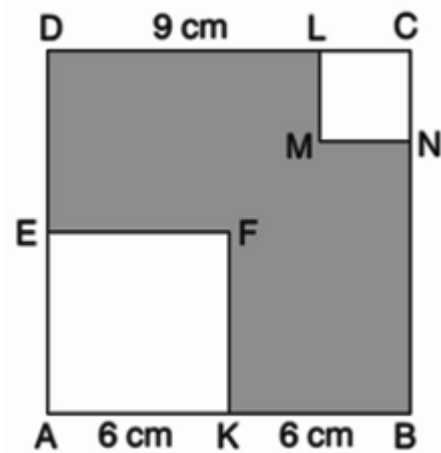
$$\text{Area of } \triangle ABD = \frac{1}{2} \times 12 \times 4 = 24\text{cm}^2,$$

$$\text{Area of } \triangle BDC = \frac{1}{2} \times 12 \times 5 = 30\text{cm}^2,$$

$$\text{total area} = 24\text{cm}^2 + 30\text{cm}^2 = 54\text{cm}^2,$$

**Answer: C**

Q26: In the figure, ABCD, AKFE and LMNC are squares. Find the area of the shaded region



- A) 104cm<sup>2</sup>
- √B) 90cm<sup>2</sup>
- C) 78cm<sup>2</sup>
- D) 86cm<sup>2</sup>

**Solution:**

$$\text{Area of } ABCD = 12 \times 12 = 144\text{cm}^2,$$

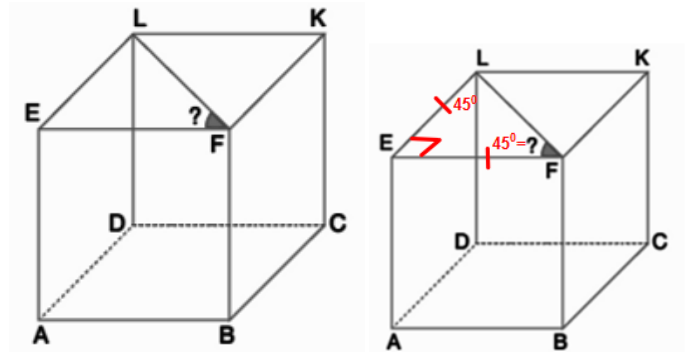
$$\text{Area of } AKFE = 6 \times 6 = 36\text{cm}^2,$$

$$\text{Area of } LMNC = 3 \times 3 = 9\text{cm}^2,$$

$$\text{shaded area} = 144 - 36 - 9 = 99\text{cm}^2,$$

**Answer: B**

Q27: The figure show a cube. What is the measure of angle EFL?

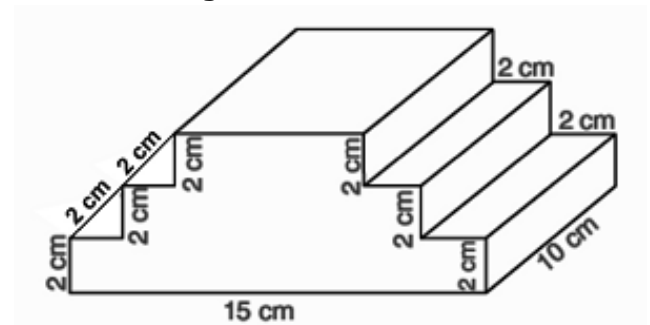


- A) 30°
- √B) 45°
- C) 60°
- D) 75°

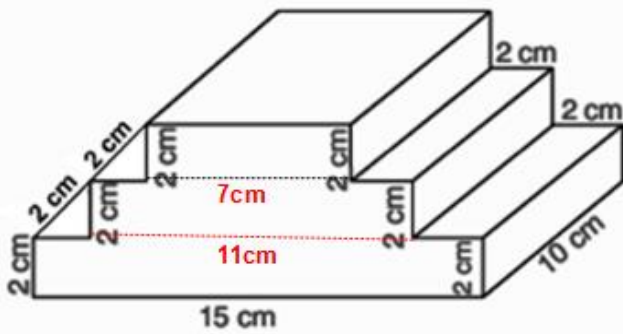
**Solution:**

**Answer: B**

Q28: Find the valume in cubic centimeters of the solid with the given dimensions.



- A) 104cm<sup>2</sup>
- √B) 90cm<sup>2</sup>
- C) 78cm<sup>2</sup>
- D) 86cm<sup>2</sup>



- √A) 660cm<sup>3</sup>                      B) 680cm<sup>3</sup>  
 C) 700cm<sup>3</sup>                      D) 720cm<sup>3</sup>

**Solution:**

$$V = 15 \times 2 \times 10 + 11 \times 2 \times 10 + 7 \times 2 \times 10$$

$$= (15 + 11 + 7) \times 2 \times 10 = 33 \times 20 = 660 \text{ cm}^3$$

**Answer: A**

**Q29:** What is the measurement of the angle between the hour-hand and the minute-hand at the time 05:20?

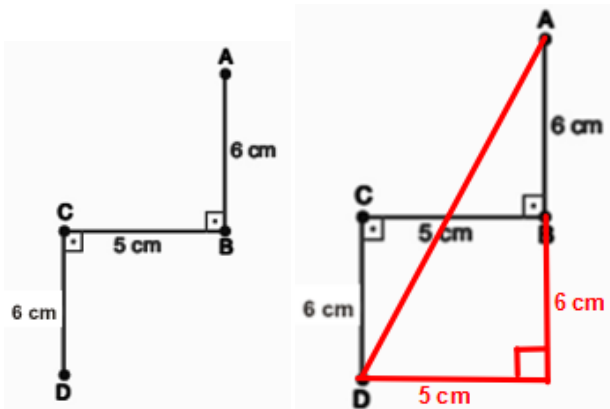
- A) 36°                      √B) 40°                      C) 44°                      D) 48°

**Solution:**

Angle between 4 to 5 is 30°. If every 60 minutes it moves 30° then in 20 minutes it will move 10°. Total makes 30°+10°=40°.

**Answer: B**

**Q30:** Find the distance between A and D



**Solution:**

$$AD^2 = 5^2 + 12^2 = 25 + 144 = 169$$

$$AD^2 = 169 \Rightarrow AD = 13 \text{ cm}$$

**Answer: B**

**Q31:** Simplify  $\frac{2\left(1+\frac{1}{a}\right) \cdot \frac{b-1}{a+1}}{1-\frac{1}{b}} + 1$

- A)  $\frac{2b}{a} - 1$                       B)  $\frac{2b}{a}$                       √C)  $1 + \frac{2b}{a}$                       D)  $\frac{a}{b}$

**Solution:**

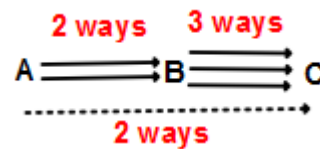
$$\frac{2\left(1+\frac{1}{a}\right) \cdot \frac{b-1}{a+1}}{1-\frac{1}{b}} + 1 = 2 \times \frac{\cancel{a+1}}{a} \times \frac{b}{\cancel{b-1}} \times \frac{\cancel{b-1}}{\cancel{a+1}} + 1 = \frac{2b}{a} + 1$$

**Answer: C**

**Q32:** There are two different ways from the city A, to the city B. There are 3 different ways from the city B, to the city C. There are two different ways from the city A to the city C that are not passing through the city B. How many different ways are there from the city A to the city C?

- A) 6                      √B) 8                      C) 10                      D) 12

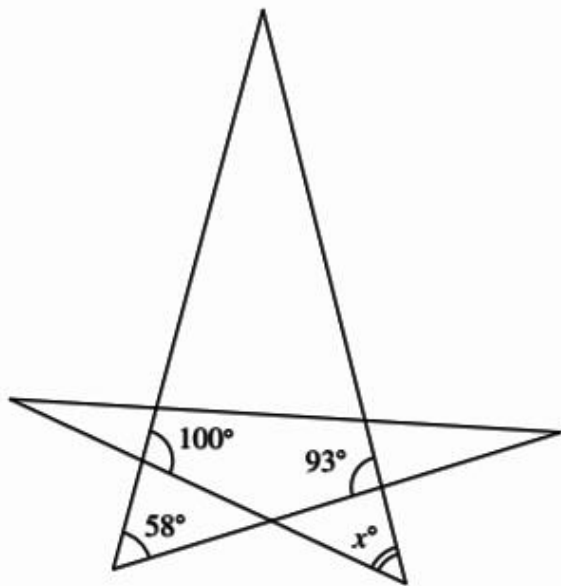
**Solution:**



A to C via B: 6 different ways  
 A to C: 2 different ways  
 Total A to C: 8 different ways

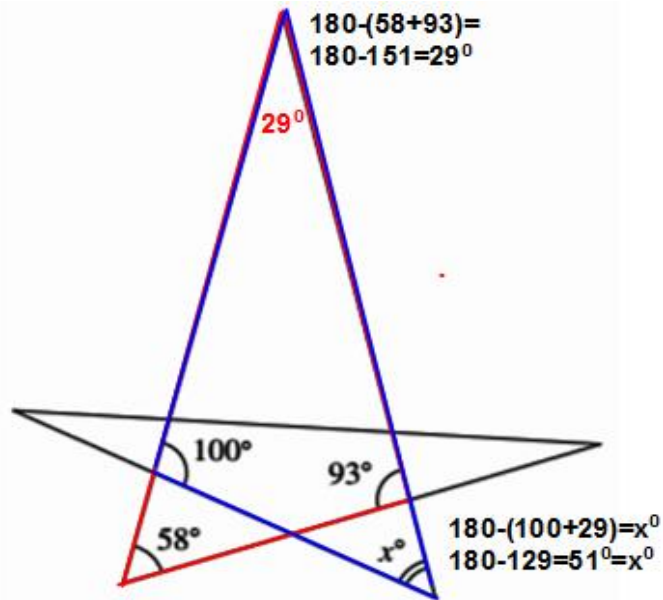
**Answer: B**

Q33: In the given figure, what is the value of angle  $x^\circ$ ?



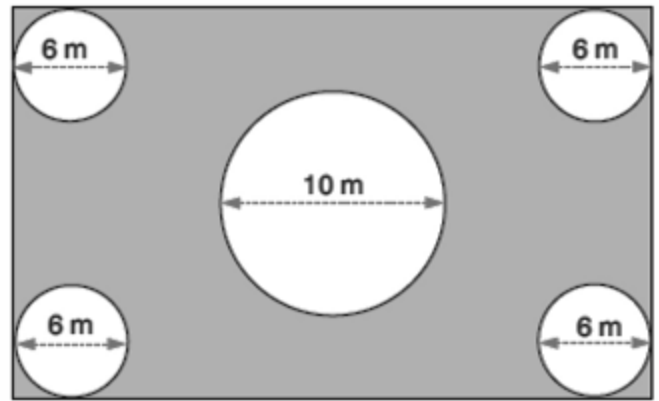
- A)  $49^\circ$       ✓B)  $51^\circ$       C)  $41^\circ$       D)  $47^\circ$

**Solution:**



**Answer: B**

Q34: The figure below shows 5 circular pools in a rectangular garden. The diameters of the circles are 6 m and 10 m and the side lengths of the garden are 20 m and 30 m. The rest of the garden is covered in grass. How much of the garden is covered in grass? ( $\pi = 3$ )



- ✓A)  $417m^2$       B)  $415m^2$   
 C)  $413m^2$       D)  $411m^2$

**Solution:**

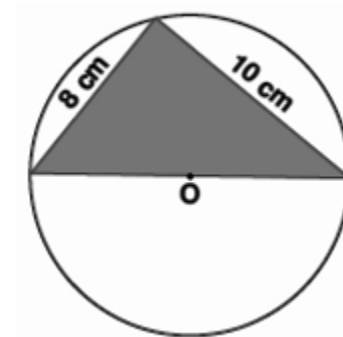
Area of Shaded Region = Area of Rectangle - (Area of 4 small circles + Area of 1 big circle)

$$= 20 \times 30 - (4 \times 3 \times 3^2 + 3 \times 5^2)$$

$$= 600 - (108 + 75) = 600 - 183 = 417m^2$$

**Answer: A**

Q35: In the figure, O is the center of the circle. Find the area of the shaded region.



- A)  $20cm^2$       ✓B)  $40cm^2$   
 C)  $60cm^2$       D)  $80cm^2$

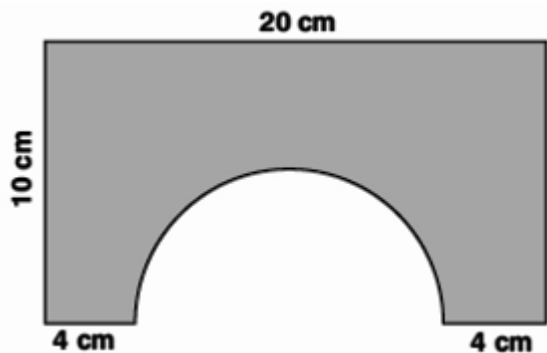
**Solution:** Area of triangle (with perpendicular sides) =

$$\frac{8 \times 10}{2} = \frac{80}{2} = 40cm^2$$

**Answer: B**



**Q36:** Find the perimeter of the shaded region  
( $\pi = 3$ )



- √A) 66cm                      B) 72cm  
C) 78cm                      D) 80cm

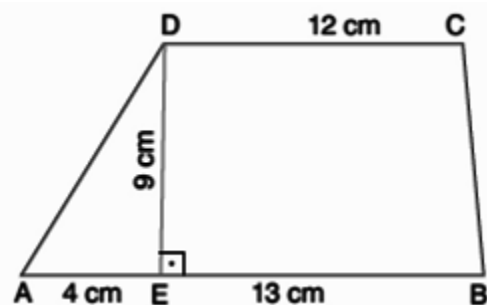
**Solution:**

Perimeter of the shaded region =

$$10 + 10 + 20 + 4 + 4 + \frac{2 \times 3 \times 6}{2} = 48 + 18 = 66 \text{ cm}$$

**Answer: A**

**Q37:** Find the area of trapezoid



- A) 130 cm<sup>2</sup>                      √B) 130.5 cm<sup>2</sup>  
C) 127 cm<sup>2</sup>                      D) 175 cm<sup>2</sup>

**Solution:**

Area of trapezium =  $\frac{1}{2}$  Sum of parallel sides  $\times$  height

$$= \frac{(12 + 17) \times 9}{2} = \frac{29 \times 9}{2} = \frac{261}{2} = 130.5 \text{ cm}^2$$

**Q38:** A gas station gives a 20% discount on gasoline. The next month it gives another 20% discount on the new price. Find the total percentage of discount on the original price.

- √A) 36%      B) 42%      C) 64%      D) 66%

**Solution:**

$$1^{\text{st}} : \frac{80x}{100} \text{ then } \frac{80x}{100} \times \frac{80}{100} = \frac{64x}{100} \Rightarrow$$

36% discount

**Answer: A**

**Q39:** In a school referendum 10% of teachers and 98% of students say "YES". All the students and teachers participate in the referendum. Referendum results as 90% "YES". Find the ratio of the number of students to the number of the teachers.

- √A) 10      B) 12      C) 15      D) 18

**Solution:**

Let Teachers :  $x$  and Students :  $y$  be

$$\frac{\frac{10x}{100} + \frac{98y}{100}}{x + y} = \frac{90}{100} \Rightarrow 10x + 98y = 90x + 90y \Rightarrow$$

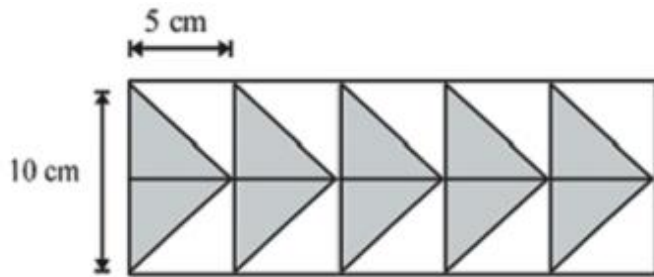
$$8y = 80x \Rightarrow \frac{y}{x} = 10 \Rightarrow y : x = 10 : 1 = 10$$

**Answer: A**





**Q48:** During an art lesson, Mudessir created a repeated pattern on a piece of paper as shown below, The area of the shaded part is .....



- A) 152cm<sup>2</sup>                      √B) 125cm<sup>2</sup>  
 C) 251cm<sup>2</sup>                      D) 521cm<sup>2</sup>

**Solution:** Area of 5 triangles:

$$= 5 \times \frac{5 \times 10}{2} = 5 \times 5 \times 5 = 125 \text{ cm}^2$$

**Answer: B**

**Q49:**  $x + y = \frac{3}{4}$ ,  $xy = \frac{1}{4}$  and  $\frac{1}{x} + \frac{1}{y} = a$  then, what is the value of  $a$

- A) 1            B) 2            √C) 3            D) 4

**Solution:**

$$\frac{1}{x} + \frac{1}{y} = a = \frac{x+y}{xy} = \frac{\frac{3}{4}}{\frac{1}{4}} = \frac{3}{4} \times \frac{4}{1} = 3$$

**Answer: C**

**Q50:** If  $\left. \begin{aligned} \frac{3}{a} + \frac{3}{b} &= 1 \\ \frac{3}{a} + \frac{3}{c} &= \frac{15}{8} \end{aligned} \right\}$  then, find the value of

$$\frac{1}{a} + \frac{1}{b} + \frac{1}{c}$$

- A)  $\frac{1}{3}$             √B)  $\frac{2}{3}$             C)  $\frac{3}{3}$             D)  $\frac{4}{3}$

**Solution:**

$$\left. \begin{aligned} \frac{3}{a} + \frac{3}{b} &= 1 \\ \frac{3}{a} + \frac{3}{c} &= \frac{15}{8} \\ \frac{3}{b} + \frac{3}{c} &= \frac{9}{8} \end{aligned} \right\} \Rightarrow \frac{6}{a} + \frac{6}{b} + \frac{6}{c} = 1 + \frac{15}{8} + \frac{9}{8}$$

$$6 \left( \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right) = \frac{8+15+9}{8} = \frac{32}{8} = 4 \Rightarrow$$

$$\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = \frac{4}{6} = \frac{2}{3}$$

**Answer: B**

