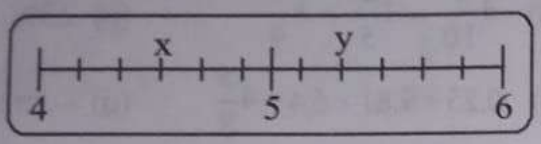
LEVEL 2

1. What is the missing value in the box?

$6\frac{3}{4}\times 1.2 = 1.2+0.9+1.2+1.2\times \boxed{?}$

(a) 4 (b) 3
(c) 2 (d) 6

2. Given figure is a number line.



What is the value of $y-x$?

(a) $\frac{5}{6}$ (b) $1\frac{1}{6}$

(c) $9\frac{2}{3}$ (d) $9\frac{5}{6}$

3. In a box, $\frac{3^{th}}{4}$ of the balls are red, $\frac{1^{th}}{6}$ are white and the rest are blue. If there are 3 blue balls in the box, how many are red?

(a) 9 (b) 18
(c) 27 (d) 36

4. A class has 35 pupils. $\frac{3}{7}$ of the class walk to school, $\frac{2}{5}$ of the class go to school by bus and the rest cycle to school. Calculate the number of pupils who cycle to school.

(a) 6 (b) 14
(c) 29 (d) 30

5. Out of the fraction, $\frac{5}{7}, \frac{7}{13}, \frac{4}{7}, \frac{4}{15}$ and $\frac{9}{14}$ which is the third highest?

(2016, Critical Thinking)

(a) $\frac{5}{12}$ (b) $\frac{7}{13}$

(c) $\frac{4}{7}$ (d) $\frac{4}{15}$

6. By how much is $\frac{1}{2}$ of $\frac{2}{3}$ more than $\frac{3}{4}$ of $\frac{1}{3}$?

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$

(c) $\frac{1}{12}$ (d) $\frac{7}{12}$

7. By how much does $\frac{6}{7/8}$ exceed $\frac{6/7}{8}$?

(a) $6\frac{3}{4}$ (b) $6\frac{1}{8}$

(c) $6\frac{3}{28}$ (d) $7\frac{3}{4}$

8. Which option is equal to $0.77 \div 7$? **(2017)**

(a) $1 \div 11$ (b) $0.66 \div 6$
(b) $7 \div 0.77$ (b) $77 \div 7$

9. What fraction of ₹ 3 is 40 paise? **(2012)**

(a) $\frac{1}{5}$ (b) $\frac{4}{9}$

(c) $\frac{2}{15}$ (d) $\frac{6}{11}$

10. What is the value of

$$3\frac{1}{12}-\left[1\frac{3}{4}+\left\{2\frac{1}{2}-\left(1\frac{1}{2}-\frac{1}{3}\right)\right\}\right]?$$

(a) 0.5 (b) 2
(c) 1 (d) 0

11. If $47.2506 = 4A+\frac{7}{B}+2C+\frac{5}{D}+6E$, then the value of $5A+3B+6C+D+3E$ is

(2016, Tricky)

(a) 53.6003 (b) 53.603
(c) 153.6003 (d) 213.0003

12. $\dfrac{5-\left[\frac{3}{4}+\left\{2\frac{1}{2}-\left(\frac{1}{2}+\overline{\frac{1}{6}-\frac{1}{7}}\right)\right\}\right]}{2}=?$ **(2016)**

(a) $1\frac{23}{168}$ (b) $2\frac{23}{168}$

(c) $3\frac{23}{168}$ (d) $4\frac{23}{168}$

13. The product of two numbers is $15\frac{5}{6}$. If one of the number is $6\frac{2}{3}$, find the other number. **(2015)**

(a) $\frac{3}{8}$ (b) $1\frac{3}{8}$

(c) $2\frac{3}{8}$ (d) $3\frac{3}{8}$

14. Calculate the value of

$$\frac{2}{5}+2\frac{4}{9}\div\left[\left(7\frac{5}{12}-5\frac{3}{4}\right)\div 22\frac{1}{2}+10\times\frac{5}{18}\right]-\frac{4}{5}$$

(2016, Critical Thinking)

(a) $\frac{9}{35}$ (b) $\frac{17}{25}$

(c) $\frac{16}{35}$ (d) $\frac{19}{35}$

15. Vijay can walk $1\frac{8}{5}$ km in an hour. How much distance will he cover in $7\frac{1}{2}$ hours?

(a) 12.5km (b) 15km

(c) 19.5km (d) 30km

16. Simplify: $2\frac{1}{2}+3\frac{5}{7}\times\frac{3}{13}-\frac{1}{2}\div 4$

(a) $\frac{188}{56}$ (b) $-\frac{181}{56}$

(c) $-3\frac{13}{56}$ (d) $3\frac{13}{56}$

17. Find the remaining part of the whole number on subtracting $\frac{7}{8}$ from the smallest whole number other than 0. **(2011, Tricky)**

(a) $\frac{1}{9}$ (b) $\frac{1}{8}$

(c) $\frac{1}{2}$ (d) $\frac{1}{3}$

18. If $1.125\times10^{k}=0.001125$, then the value of k is: **(2015, Tricky)**

(a) -4 (b) -3

(c) -2 (d) -1

19. If $\frac{37}{13}=2+\cfrac{1}{a+\cfrac{1}{b+\cfrac{1}{c}}}$ where a, b, c are natural numbers, then the value of a, b and c respectively are – **(2016, Tricky)**

(a) 1, 5, 3 (b) 1, 3, 5

(c) 1, 5, 2 (d) 1, 2, 5

20. Find the value of $\frac{0.34-0.034}{0.0034\div34}$.

(a) 3060 (b) 306

(c) 0.306 (d) 0.0306

21. Simplify: $0.1+0.01+0.001+\frac{1}{10}+\frac{1}{100}+\frac{1}{1000}$ **(2015, Tricky)**

(a) 0.222 (b) 0.333

(c) 0.111 (d) 0.010

22. If $M=9, N=\frac{33}{5}\times\frac{15}{11}$, find the value of $\frac{M}{N}$.

(a) 1 (b) 9

(c) 3 (d) 6

23. Is this statement true or false? $\left[\frac{z}{3}\div y\right]\div 0=4$ **(2014, Tricky)**

(a) False (b) True

(c) Cannot be defined (d) All of these

24. Simplify: $(0.90 + 0.008) - (34.53 + 74.56)$ **(2013)**

(a) -111.980 (b) -231.450
(c) -108.182 (d) 500.800

DIRECTIONS (Qs. 25 to 28) : Mrs. Sharma bought $45\frac{1}{4}$ metres of fabric. She used $29\frac{1}{4}$ metres to make 12 curtains. Remaining is used to make four cushion covers.

25. How much fabric is used for cushion cover?

(a) 20m (b) 16m
(c) 18m (d) 22m

26. How much fabric is needed for one curtain?

(a) $3\frac{7}{16}$m (b) $2\frac{7}{15}$m
(c) $2\frac{7}{16}$m (d) $\frac{7}{16}$m

27. How much fabric is used to make one cushion cover?

(a) $2\frac{2}{3}$m (b) $3\frac{1}{2}$m
(c) $3\frac{2}{3}$m (d) 4m

28. Fabric bought by Mrs. Sharma (in cm) is

(a) 4525 cm (b) 4225 cm
(c) 4725 cm (d) 5025 cm

DIRECTIONS (Qs. 29to 31) : A group of 20 people went to Restaurant. 9 of them ordered a meal of ₹42.20 each and 7 of them ordered a meal of ₹47.60 each and rest ordered a meal of ₹50 each.

29. How much money spent by 9 people who ordered same meal?

(a) ₹369.80 (b) ₹379.80
(c) ₹309.80 (d) ₹389.80

30. Total money spent by 20 people is

(a) ₹915 (b) ₹895
(c) ₹913 (d) ₹900

31. How much more money they would spend if all ordered meal of ₹47.60?

(a) ₹38 (b) ₹40
(c) ₹45 (d) ₹39

DIRECTIONS (Qs. 32 to 35) :

Rahul walks $\frac{2}{5}$ km from his home and reach at point A then he walk straight about 450 metres and stop there. His friend walking towards Rahul and has covered 850 metres. Distance between their homes is 2 km.

32. Distance between Rahul and his friend is

(a) 1.2km (b) 30m
(c) 300m (d) 400m

33. Total distance covered by Rahul and his friend (in km) is

(a) 1.8km (b) 1.6km
(c) 1.9km (d) 1.7km

34. Distance of point A from Rahul's friend home (in metres) is

(a) 1,520m (b) 1,400m
(c) 1600m (d) 1500m

35. If Rahul want to reach his friend home, then how much more distance he has to cover?

(a) 1150m (b) 1.2km
(c) 1120m (d) 1.15km

33. (a) $\frac{0.1}{0.01}+\frac{0.01}{0.1}=10+\frac{1}{10}=10.1$

34. (c) Required difference $=\frac{11}{9}-\frac{1}{9}=\frac{10}{9}$

35. (d) (A) → (s); (B) → (r); (C) → (p) ; (D) → (q)

(A) $4\frac{3}{10}-1\frac{2}{5}+8\frac{1}{9}=\frac{43}{10}-\frac{7}{5}+\frac{73}{9}$

$=\frac{387-126+730}{90}=\frac{991}{90}=11.01$

(B) $0.25+9.81\times 6.4+4\frac{5}{8}$

$=0.25+62.784+\frac{37}{8}$

$=63.034+4.625=67.659$

(C) $2\frac{3}{8}-4\frac{7}{9}\times 0.9+4.32$

$=\frac{19}{8}-\frac{43}{9}\times 0.9+4.32$

$=\frac{19}{8}-4.3+4.32$

$=2.375-4.3+4.32$

$=6.695-4.3=2.395$

(D) $2\frac{7}{8}+\frac{5}{8}-0.9345\times 100$

$=\frac{23}{8}+\frac{5}{8}-93.45=\frac{28}{8}-93.45$

$=3.5-93.45=-89.95$

LEVEL–2

1. (a) $6\frac{3}{4}\times 1.2=1.2+0.9+1.2+1.2\times\boxed{?}$

$\frac{27}{4}\times 1.2=3.3+1.2\times\boxed{?}$

$6.75\times 1.2=3.3+1.2\times\boxed{?}$

$8.1=3.3+1.2\times\boxed{?}$

$4.8+3.3=3.3+1.2\times\boxed{?}$

or $1.2\times\boxed{4}+3.3=3.3+1.2\times\boxed{?}$

On comparing we get $\boxed{?}=4$

2. (a) Hence, $x=4+\frac{3}{6}=4\frac{1}{2}=\frac{9}{2}$

and $y=5+\frac{2}{6}=5\frac{1}{3}=\frac{16}{3}$

$\therefore\ y-x=\frac{16}{3}-\frac{9}{2}=\frac{32-27}{6}=\frac{5}{6}$

3. (c) Fraction for blue balls $=1-\left(\frac{3}{4}+\frac{1}{6}\right)$

$=1-\left(\frac{9+2}{12}\right)=1-\frac{11}{12}=\frac{1}{12}$

$\therefore$ Blue balls $=3$

or $\frac{1}{12}$ of total balls $=3$

$\Rightarrow$ Total number of balls $=3\times 12=36$

Hence number of red balls $=\frac{3^{th}}{4}$ of 36

$=\frac{3}{\cancel{4}}\times\cancel{36}^{9}=27$

4. (a) Total number of pupils $=35$

Number of pupils who walk $=\frac{3}{7}$ of $35=15$

No. of pupils who go by bus $=\frac{2}{5}$ of $35=14$

Number of pupils who cycle to school

$=35-(15+14)=35-29=6$

5. (c) $\frac{5}{7}=0.714....,\frac{7}{13}=0.538....\frac{4}{7}=0.571....$

$\frac{4}{15}=0.266....$ and $\frac{9}{14}=0.06.....$

Thus 0.571..... or $\frac{4}{7}$ is the third highest fraction.

6. (c) $\frac{1}{2}$ of $\frac{2}{3} = \frac{1}{\cancel{2}_1} \times \frac{\cancel{2}^1}{\cancel{3}} = \frac{1}{3}$

$\frac{3}{4}$ of $\frac{1}{3} = \frac{\cancel{3}^1}{4} \times \frac{1}{\cancel{3}_1} = \frac{1}{4}$

$\therefore$ Difference $= \frac{1}{3} - \frac{1}{4} = \frac{4-3}{2} = \frac{1}{12}$

7. (a) $\frac{6}{7/8} = 6 \div \frac{7}{8} = 6 \times \frac{8}{7} = \frac{48}{7}$

$\frac{6/7}{8} = \frac{6}{7} \div 8 = \frac{\cancel{6}^3}{7} \times \frac{1}{\cancel{8}_4} = \frac{3}{28}$

$\therefore$ Difference $= \frac{48}{7} - \frac{3}{28} = \frac{192-3}{28} = \frac{189}{28}$

$= 6\frac{3}{4}$

8. (b) Here $0.77 \div 7 = 0.11$

$1 \div 11 = 0.0909....$

$0.66 \div 6 = 0.11$

$7 \div 0.77 = 9.0909....$

$77 \div 7 = 11$

Hence $0.77 \div 7 = 0.66 \div 6$

9. (c) ₹ 3 = 300 Paise

$\therefore$ Required fraction $= \frac{\cancel{40}^2}{\cancel{300}_{15}} = \frac{2}{15}$

10. (d) $3\frac{1}{12} - \left[1\frac{3}{4} + \left\{2\frac{1}{2} - \left(1\frac{1}{2} - \frac{1}{3}\right)\right\}\right]$

$= \frac{37}{12} - \left[\frac{7}{4} + \left\{\frac{5}{2} - \left(\frac{3}{2} - \frac{1}{3}\right)\right\}\right]$

$= \frac{37}{12} - \left[\frac{7}{4} + \left\{\frac{5}{2} - \frac{7}{6}\right\}\right]$

$= \frac{37}{12} - \left[\frac{7}{4} + \frac{4}{3}\right] = \frac{37}{12} - \frac{37}{12} = 0$

11. (c) 47.2506

$= (4 \times 10) + \frac{7}{1} + \frac{2}{10} + \frac{5}{100} + 0 + \frac{6}{10000}$

$= 4A + \frac{7}{B} + 2C + \frac{5}{D} + 6E$

On comparing, we get

$A = 10, B = 1, C = \frac{1}{10}, D = 100, E = \frac{1}{10000}$

Now $5A + 3B + 6C + D + 3E$

$= (5 \times 10) + (3 \times 1) + \left(6 \times \frac{1}{10}\right) + 100 + 3 \times \frac{1}{10000}$

$= 50 + 3 + \frac{6}{10} + 100 + \frac{3}{10000} = 153.6003$

12. (a) $5 - \left[\frac{3}{4} + \left\{2\frac{1}{2} - \left(\frac{1}{2} + \overline{\frac{1}{6} - \frac{1}{7}}\right)\right\}\right]$

$= 5 - \left[\frac{3}{4} + \left\{\frac{5}{2} - \left(\frac{1}{2} + \frac{1}{42}\right)\right\}\right]$

$= 5 - \left[\frac{3}{4} + \left\{\frac{5}{2} - \frac{11}{21}\right\}\right]$

$= 5 - \left[\frac{3}{4} + \frac{83}{42}\right] = 5 - \frac{229}{84} = \frac{191}{84}$

Now, $\frac{191}{84} \div 2 = \frac{191}{168} = 1\frac{23}{168}$

13. (c) Product of two numbers $= 15\frac{5}{6}$

One number $= 6\frac{2}{3}$

other number $= 15\frac{5}{6} \div 6\frac{2}{3}$

$= \frac{95}{6} \div \frac{20}{3} = \frac{\cancel{95}^{19}}{\cancel{6}_2} \times \frac{\cancel{3}^1}{\cancel{20}_4} = \frac{19}{8} = 2\frac{3}{8}$

14. (c) $\frac{2}{5} + 2\frac{4}{9} \div \left[\left(7\frac{5}{12} - 5\frac{3}{4}\right) \div 22\frac{1}{2} + 10 \times \frac{5}{18}\right] - \frac{4}{5}$

$= \frac{2}{5} + \frac{22}{9} \div \left[\left(\frac{89}{12} - \frac{23}{4}\right) \div \frac{45}{2} + \frac{25}{9}\right] - \frac{4}{5}$

$= \frac{2}{5} + \frac{22}{9} \div \left[\frac{5}{3} \div \frac{45}{2} + \frac{25}{9}\right] - \frac{4}{5}$

$= \frac{2}{5} + \frac{22}{9} \div \left[\frac{2}{27} + \frac{25}{9}\right] - \frac{4}{5}$

$$= \frac{2}{5} + \frac{22}{9} \div \frac{77}{27} - \frac{4}{5}$$

$$= \frac{2}{5} + \frac{6}{7} - \frac{4}{5} = \frac{6}{7} - \frac{2}{5} = \frac{16}{35}$$

15. **(c)** Vijay walks in 1 hour $= 1\frac{8}{5}$ km

Vijay walks in $7\frac{1}{2}$ hours $= 1\frac{8}{5} \times 7\frac{1}{2}$

$$= \frac{13}{15} \times \frac{15}{2} = \frac{39}{2} = 19.5 \text{ km}$$

16. **(d)** $2\frac{1}{2} + 3\frac{5}{7} \times \frac{3}{13} - \frac{1}{2} \div 4$

$$= \frac{5}{2} + \frac{26}{7} \times \frac{3}{13} - \frac{1}{2} \times \frac{1}{4} = \frac{5}{2} + \frac{6}{7} - \frac{1}{8}$$

$$= \frac{140 + 48 - 7}{56} = \frac{181}{56} = 3\frac{13}{56}$$

17. **(b)** Smallest whole number other than 0 = 1

$\therefore$ Required part $= 1 - \frac{7}{8} = \frac{1}{8}$

18. **(b)** $1.125 \times 10^k = 0.001125$

$\Rightarrow 1.125 \times 10^k = 1.125 \times 10^{-3}$

$\therefore \quad k = -3$

19. **(c)** $\frac{37}{13} = 2\frac{11}{13} = 2 + \frac{11}{13}$

$$= 2 + \frac{1}{\frac{13}{11}} = 2 + \frac{1}{1\frac{2}{11}}$$

$$= 2 + \frac{1}{1 + \frac{1}{\frac{11}{2}}} = 2 + \frac{1}{1 + \frac{1}{5\frac{1}{2}}}$$

$$= 2 + \frac{1}{1 + \frac{1}{5 + \frac{1}{2}}} = 2 + \frac{1}{a + \frac{1}{b + \frac{1}{c}}}$$

On comparing, we get
$a = 1, b = 5$ and $c = 2$.

20. **(a)** $\frac{0.34 - 0.034}{0.0034 \div 34} = \frac{0.3060}{0.0001} = 3060$

21. **(a)** $0.1 + 0.01 + 0.001 + \frac{1}{10} + \frac{1}{100} + \frac{1}{1000}$

$$= \frac{1}{10} + \frac{1}{100} + \frac{1}{1000} + \frac{1}{10} + \frac{1}{100} + \frac{1}{1000}$$

$$= \frac{2}{10} + \frac{2}{100} + \frac{2}{1000} = 0.222$$

22. **(a)** $M = 9, N = \frac{33}{5} \times \frac{15}{11} = 9$

$\therefore \quad \frac{M}{N} = \frac{9}{9} = 1$

23. **(c)** Division by zero cannot be defined.

24. **(c)** $(0.90 + 0.008) - (34.53 + 74.56)$
$= 0.908 - 109.09$
$= -108.182$

25. **(b)** $45\frac{1}{4} - 29\frac{1}{4} = \frac{181 - 117}{4} = 16 \text{ m}$

26. **(c)** $29\frac{1}{4} \div 12 = \frac{117}{4 \times 12} = \frac{39}{16} = 2\frac{7}{16} \text{ m}$

27. **(d)** $\frac{16 \text{ m}}{4} = 4$

28. **(a)** 4525 cm

29. **(b)** Money spent by 9 people
$= ₹42.20 \times 9 = ₹379.80$

30. **(c)** $42.20 \times 9 + 47.60 \times 7 + 50 \times 4$
$= 379.80 + 333.20 + 200$
$= ₹913$

31. **(d)** If cost of one plate is ₹ 47.60
Total cost of 20 plates $= 47.60 \times 20 = 952$
Difference $= ₹952 - ₹913 = ₹39$

32. **(c)** Rahul walks $\frac{2}{5}$ km $= \frac{2}{5} \times 1000 = 400$ m

From point A he walks 450 m.
Distance covered by Rahul = 400 + 450
= 850 m.
Also his friend has covered = 850 m.
Both has covered (850 + 850) = 1700 m.
Distance between Rahul and his friend
= 2000 m − 1700 m = 300 m

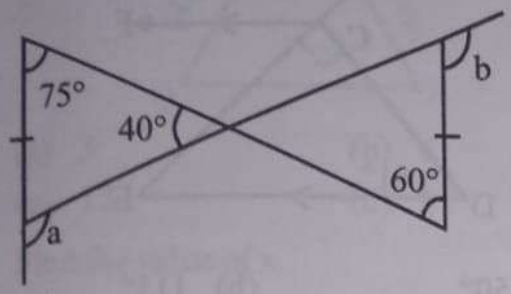
33. **(d)** Total required distance = 1.7 km

34. **(c)** $(2000 - 400)$ m
$= 1600$ m

35. **(d)** $2 \text{ km} - 0.85 \text{ km} = 1.15 \text{ km}$

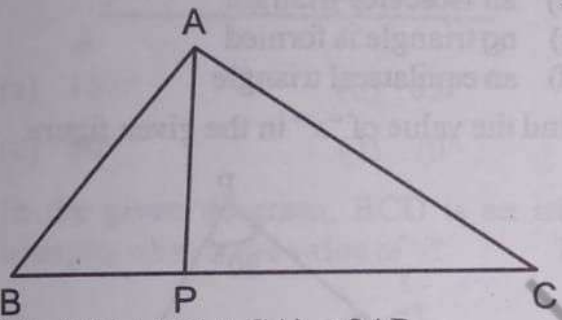
LEVEL 2

1. In the given figure, (a + b) equals



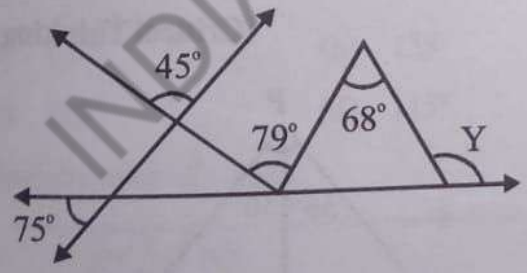
(a) 235° (b) 215°
(c) 195° (d) 225°

2. In the given figure P is the point on side BC. Which one of the following is correct ? **(2011)**



(a) (AB + BC + CA) < 2AP
(b) (AB + BC + CA) > 2AP
(c) (AB + BC + CA) < AP
(d) (AB + BC + CA) > AP

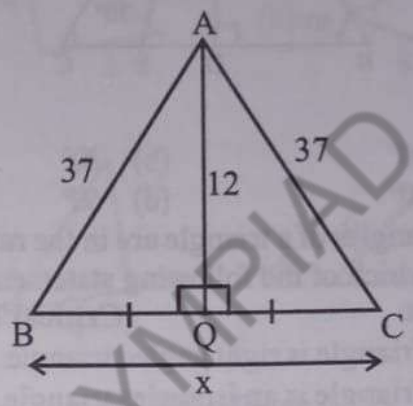
3. Find the measure of y in the figure given below. **(2011)**



(a) 37° (b) 61°
(c) 67° (d) 109°

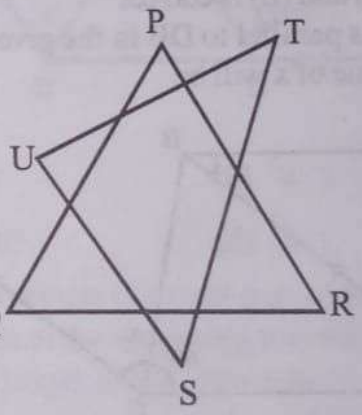
4. If one angle of a triangle is equal to the sum of the other two angles, the triangle must be:
(a) scalene (b) right angled
(c) obtuse angled (d) actute angled

5. The value of x in the figure is **(2012)**



(a) 35 (b) 70
(c) 55 (d) 65

6. The following figure is made by using two triangles. Find the value of ∠P + ∠Q + ∠R + ∠S + ∠T + ∠U. **(Tricky)**



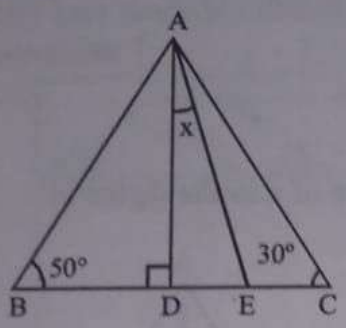
(a) 180° (b) 175°
(c) 360° (d) 285°

7. The two legs of a right triangle are equal and the square of the hypotenuse is 50. The length of each leg is
(a) 25 (b) 5
(c) 10 (d) 12.5

8. The perimeter of a rectangle whose one side measure 20 m and the diagonal is 29 m
(a) 82 m (b) 78 cm
(c) 98 m (d) 88 m

9. Which of the following is correct measurements of sides of a right angled triangle?
(a) 9, 12, 15 (b) 7, 8, 10
(c) 7, 24, 26 (d) 2, 3, 6

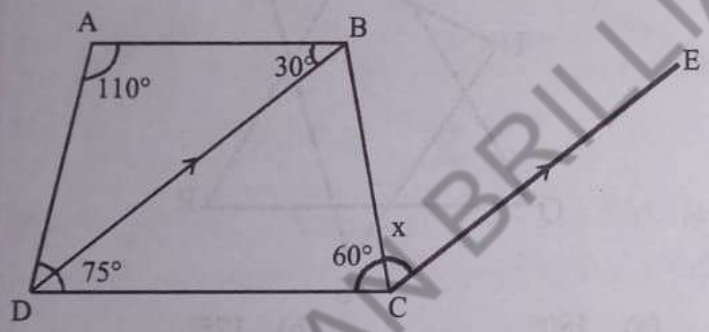
10. Find the value of x in the following figure if AD ⊥ BC and AE is the bisector of ∠BAC. **(2013)**



(a) 30° (b) 20°
(c) 10° (d) 60°

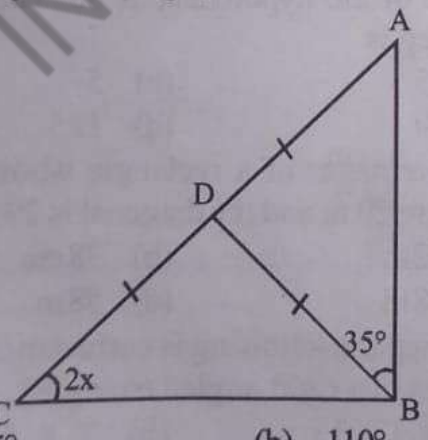
11. If the angles of a triangle are in the ratio 1 : 2 : 1 then which of the following statement (s) is/are correct **(Critical Thinking)**
(i) Triangle is right angled triangle.
(ii) Triangle is an isosceles triangle.
(iii) Angles of triangle are 45°, 45° and 90° respectively.
(a) (i) and (iii) is correct
(b) Only (iii) is correct
(c) (ii) and (iii) is correct
(d) (i) and (ii) is correct

12. If CE is parallel to DB in the given figure, then the value of x will be



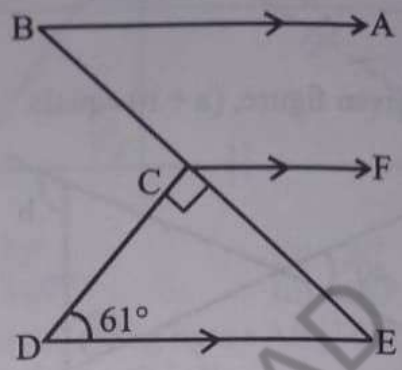
(a) 45° (b) 75°
(c) 30° (d) 85°

13. In the given triangle, the value of x is



(a) 55° (b) 110°
(c) 70° (d) 27.5°

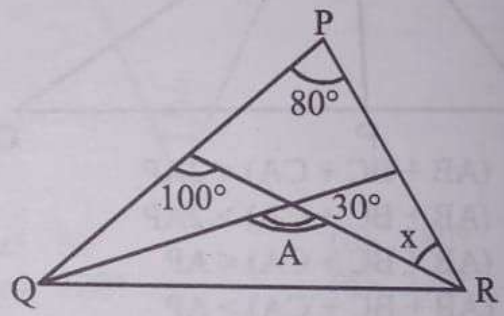
14. In the given figure BA || CE || DE. BCE is a straight line and ∠DCE is a right angle. ∠BCF is equal to



(a) 150° (b) 115°
(c) 151° (d) 105°

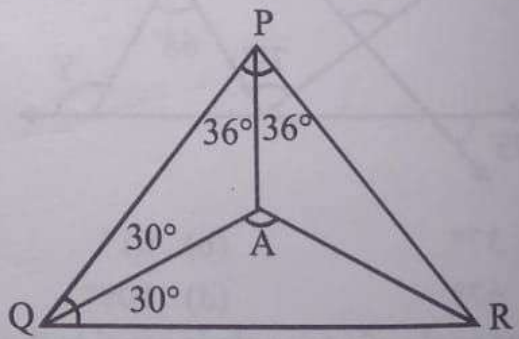
15. Which triangle is formed by AB = 3cm, BC = 4cm and AC = 8cm ?
(a) a scalene triangle
(b) an isosceles triangle
(c) no triangle is formed
(d) an equilateral triangle

16. Find the value of "x" in the given figure.



(a) 50° (b) 150°
(c) 20° (d) 80°

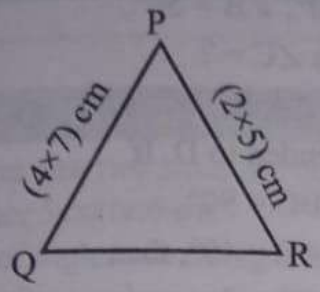
17. What is the measure of angle QAR in △ PQR?
(Critical Thinking, 2015)



(a) 110° (b) 115°
(c) 120° (d) 126°

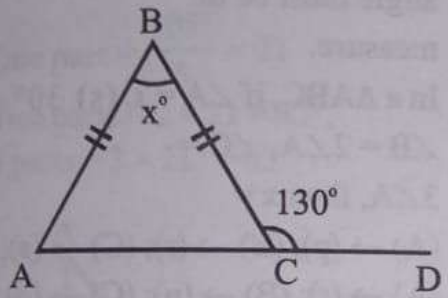
18. In the figure below, PQR is an equilateral triangle. Find the length of QR in cm.

(Tricky)



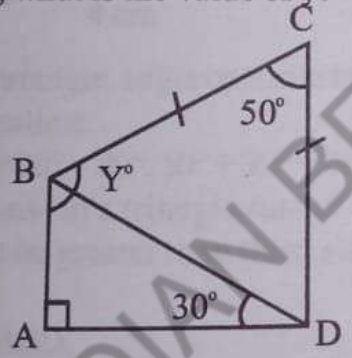
(a) 3 (b) 6
(c) 15 (d) 17

19. Find the value of x.



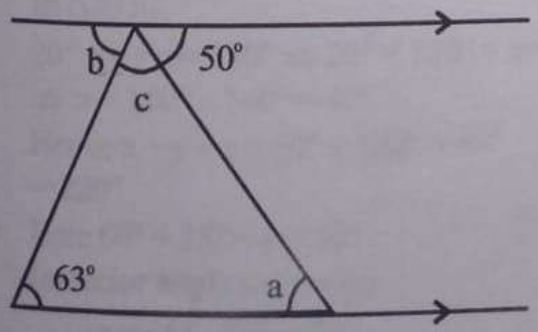
(a) 100° (b) 65°
(c) 80° (d) 70°

20. In the given diagram, BCD is an isosceles triangle, what is the value of y? **Tricky)**



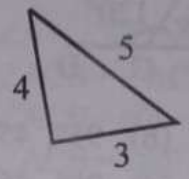
(a) 145° (b) 135°
(c) 125° (d) 115°

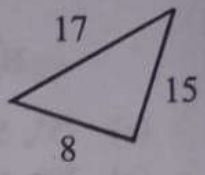
21. Find the sum of a and c.

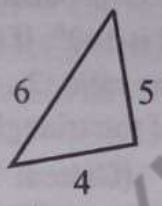


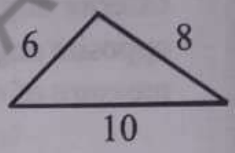
(a) 135° (b) 117°
(c) 127° (d) 120°

22. Which of the following is not a right-angled triangle?

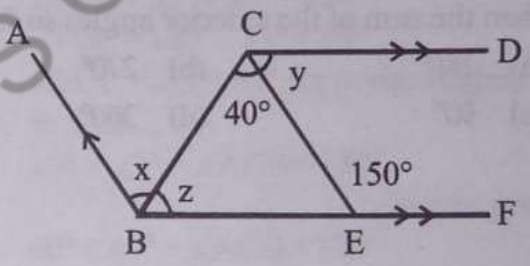
(a) 

(b) 

(c) 

(d) 

23. Find x : y in the given figure.



(a) 5 : 7 (b) 4 : 3
(c) 3 : 10 (d) 4 : 3

24. The hypotenuse of a right angled triangle is 15 cm. If one of the remaining two sides is 9 cm, find the length of the other side.

(a) 10 cm (b) 12 cm
(c) 15 cm (d) 17 cm

25. The lengths of the sides of two triangles are given below. Which of the following is a right angled triangle?

(i) $a = 15$ cm, $b = 20$ cm and $c = 25$ cm
(ii) $a = 7$ cm, $b = 6$ cm and $c = 13$ cm

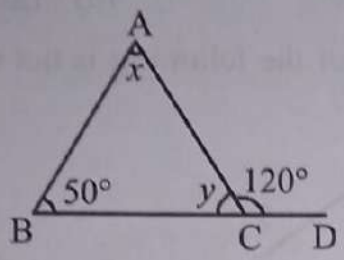
(a) only (i) (b) only (ii)
(c) both (i) and (ii) (d) None of these

26. A man goes 12 m due east and then 9 m due north. How far is he from his initial position?

(Tricky)

(a) 15 m (b) 17 m
(c) 21 m (d) 23 m

27. In the given figure, find the values of x and y.



(a) 75°, 50° (b) 95°, 45°
(c) 70°, 60° (d) 90°, 45

28. One side of a triangle is produced and the exterior angle so formed is 140°. If the interior opposite angles are in the ratio. 2 : 5, find the measure of each angle of the triangle.

(Critcal Thinking)

(a) 45°, 75°, 60° (b) 40°, 70°, 70°
(c) 40°, 100°, 40° (d) 40°, 75°, 65°

29. If the sides of a triangles are produced in order, then the sum of the exterior angles so formed is

(a) 180° (b) 270°
(c) 90° (d) 360°

30. **Match the following columns:**

	Column-I	Column-II
(A)	In a ΔABC, if $\angle A = 30°$, $\angle B = 50°$, then $\angle C = ?$	(p) 130°
(B)	In a ΔABC, BC is extended to D. If $\angle ABC = 90°$, $\angle BAC = 40°$, then $\angle ACD = ?$	(q) 90°
(C)	In a right angled triangle, greatest angle must be of measure.	(r) 100°
(D)	In a ΔABC, if $\angle A = x$, $\angle B = 2\angle A$, $\angle C = 3\angle A$, then $x =$	(s) 30°

(a) (A) → (p); (B) → (r); (C) → (s); (D) → (q)
(b) (A) → (r); (B) → (p); (C) → (q); (D) → (s)
(c) (A) → (p); (B) → (q); (C) → (s); (D) → (r)
(d) (A) → (q); (B) → (r); (C) → (p); (D) → (s)

$125° = y° + 50°$ (exterior angle property)
$\Rightarrow y = 75°$
Also $80° + y° + x° = 180°$ (straight line)
$\Rightarrow x° = 180° - 80° - 75° = 25°$

36. (d) In ΔAEC,
$\angle AED = \angle EAC + \angle ECA = 10° + 30° = 40°$
(exterior angle property)
In ΔAEC
$\angle ADE + \angle AED + \angle DAE = 180°$
$\Rightarrow 40° + 2x = 180°$
$x = 70°$
Now $\angle ADE + \angle BCE = 180°$
(Co-interior angles)
$\Rightarrow x + (y+30) = 180°$
$y = 180° - 130° - 70° = 80°$
Hence $x - y = 70° - 80° = (-10°)$

37. (c) In ΔADC
$AC = DC$ (given)
$\therefore \angle ADC = \angle DAC = 70°$
(angle opposite to equal sides are equal)
$\angle BDA + \angle ADC = 180°$ ($\because$ Straight angle)
$y + 70° = 180°$
$y = 180° - 70° = 110°$

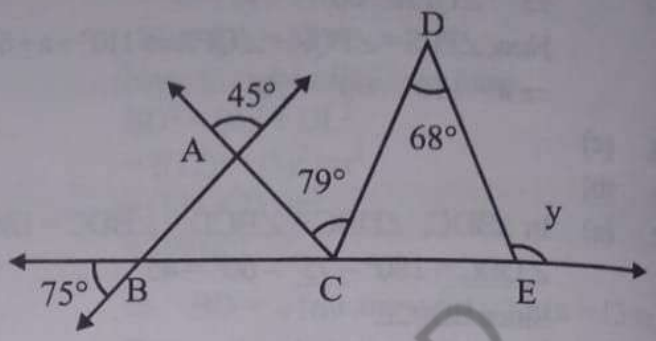
38. (b) Since AB = CD and BC and AD are transversal
Then, $X = 35°$ and $Z = 75°$
(alternate interior angle)
And $Y = 180° - 35° - 75° = 70°$
Now $X + Y + Z = 35° + 70° + 75° = 180°$

LEVEL – 2

1. (b) $a = 75° + 40° = 115°$
$b = 60° + 40° = 100°$
(angle opposite to 40° is equal to 40°)
$a + b = 115° + 100° = 215°$

2. (b) In ΔABP,
$AB + BP > AP$ ...(i)
(Sum of any two sides of a triangle is always greater than the third side)
In ΔAPC,
$AC + PC > AP$ ...(ii)
(Sum of any two sides of a triangle is always greater than the third sides)
Adding (i) and (ii), we get
$AB + BP + PC + AC > AP + AP$
$(AB + BC + AC) > 2AP$

3. (d)



$\angle BAC = 45°$ and $\angle ABC = 75°$
(Vertically opposite angles)
In ΔABC,
$\angle ACB = 180° - (75° + 45°) = 60°$
(By angle sum property)
Also, $\angle ACB + \angle ACD + \angle DCE = 180°$
(Straight angle)
$\Rightarrow \angle DCE = 180° - (79° + 60°) = 41°$
Hence, by exterior angle property,
$y° = 68° + 41° = 109°$

4. (b) Let x, y and z is the angles, where $x = y + z$
$x + y + z = 180°$ (angle sum property)
$(y + z) + y + z = 180°$
$2(y + z) = 180°$

$$y + z = \frac{180°}{2} = 90°$$

$x = 90°$, hence triangle is right angled.

5. (b) ΔAQC is a right angled triangle
$(AQ)^2 + (QC)^2 = (AC)^2$
$(QC)^2 = (AC)^2 - (AQ)^2$
$(QC)^2 = (37)^2 - (12)^2$
$1369 - 144 = 1225$
$(QC)^2 = (35)^2 \Rightarrow QC = 35$
$BC = BQ + QC = 35 + 35 = 70$
[given $BQ = QC$]

6. (c) In ΔPQR,
$\angle P + \angle Q + \angle R = 180°$ .... (i)
(Angle sum Property)
Also, in ΔSTU,
$\angle S + \angle T + \angle U = 180°$ .... (ii)
(Angle Sum Property)
Adding (i) and (ii), we get
$\angle P + \angle Q + \angle R + \angle S + \angle T + \angle U$
$= 180° + 180° = 360°$

7. (b) Let two equal side be x
$x^2 + x^2 = 50$ [Pythogoras theorem]
$2x^2 = 50$
$x^2 = 25$
$x = 5$

8. (a) In rectangle
$l^2 + b^2 = d^2$
$b^2 = d^2 - l^2 = (29)^2 - (20)^2$
$= 841 - 400 = 441$
$b = 21$ m
Perimeter $= 2(20 + 21)$ m $= 82$ m

9. (a) $\{9^2 + 12^2 = 15^2\}$

10. (c) In ΔABC,
$\angle BAC + \angle ABC + \angle ACB = 180°$
$\angle BAC + 50° + 30° = 180°$
$\angle BAC = 180° - 80°$
$\angle BAC = 100°$
Since, AE is bisector of $\angle BAC$
$\Rightarrow \angle BAE = \angle EAC = 50°$ (1)
In ΔBAD
$\angle BAD + \angle ABD + \angle ADB = 180°$
$\angle BAD + 50 + 90 = 180°$
$\angle BAD = 180 - 140°$
$\angle BAD = 40°$ ...(2)
From (1) $\angle BAE = 50°$
$\angle BAD + \angle DAE = 50°$
$40° + x = 50°$
$\Rightarrow x = 50° - 40° = 10°$

11. (d)

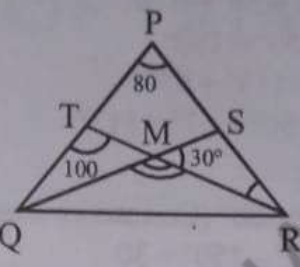
12. (d) $\angle ABD + \angle BDA + \angle BAD = 180°$ [ASP]
$30° + \angle BDA + 110° = 180°$
$\angle BDA = 180° - 140° = 40°$
$\angle BDA + \angle BDC = 75°$
$\angle BDC = 75° - \angle BDA = 75° - 40° = 35°$
In triangle DBC.
$\angle BDC + \angle DCB + \angle CBD = 180°$
$35° + 60° \angle CBD = 180°$
$\angle CBD = 180° - 95° = 85°$
$\angle x = \angle CBD$ {alternate interior angles}
$x = 85°$

13. (d) In ΔDBA, $DB = DA$
$\Rightarrow \angle DBA = \angle BAD = 35°$
In ΔBCD, $DC = DB \Rightarrow \angle CBD = \angle BCD = 2x$
In ΔABC, $\angle A + \angle B + \angle C = 180°$
$35° + (35 + 2x) + 2x = 180°$
$4x = 180° - 70° = 110°$
$x = \frac{110°}{4} = 27.5°$

14. (c) In ΔDEC, $\angle D + \angle C + \angle E = 180°$
$\angle E = 180° - 61° - 90° = 29°$
$\angle ABC = \angle BED = 29°$
$\angle ABC + \angle BCF = 180°$
$\angle BCF = 180° - 29° = 151°$

15. (c)

16. (c)



$\angle MTP = 180° - \angle PTM$
$\angle MTP = 180° - 100°$
$\angle MTP = 80° \Rightarrow \angle MTP = \angle RTP = 80°$ (1)
In ΔTPR,
$\angle PRT + \angle RTP + \angle TPR = 180°$
$X + 80° + 80° = 180°$
$X = 180° - 160°$
$X = 20$

17. (d) In PQR,
$\angle P + \angle Q + \angle R = 180°$ (Angle sum Property)
$72° + 60° + \angle R = 180°$
$\angle R = 180° - 72° - 60° = 48°$
$\therefore \angle QRA = \angle PRA = \frac{48°}{2} = 24°$
In ΔQAR,
$\angle Q + \angle A + \angle R = 180°$
$30° + \angle A + 24° = 180°$
$\angle A = 180° - 30° - 24 = 126°$

18. (a) $QR = (4x + 7)$ cm $= (2x + 5)$ cm
(Equilateral triangle)
or $(4x + 7) = (2x + 5)$
$\Rightarrow 2x = -2\ x = (-1)$
$\therefore QR = 4x + 7 = 4(-1) + 7 = 3$ cm

19. (c) $\angle BCA = 180° - 130° = 50°$ (Linear Pair)
$\angle BAC = \angle BCA = 50°$
(Angles opposite to equal sides are equal
$\therefore x + 50° + 50° = 180°$
$x = 180° - 100° = 80°$

20. (c) In ΔBCD
$\angle C + \angle CBD + \angle BDC = 180°$
$50° + \angle CBD + \angle CBD = 180°$
$2\angle CBD = 130°$
$\angle CBD = 65°$

In ΔBAD,
$\angle ABD + \angle A + \angle BDA = 180°$
$\angle ABD + 90° + 30° = 180°$
$\angle ABD = 60°$
$\therefore y = 65° + 60° = 125°$

21. **(b)** $a = 50°$ and $b = 63°$ (alternate interior angles)
Now $b + c + 50° = 180°$
$63° + c + 50° = 180°$
$c = 180° - 113° = 67°$
$\therefore a + c = 50° + 67° = 117°$

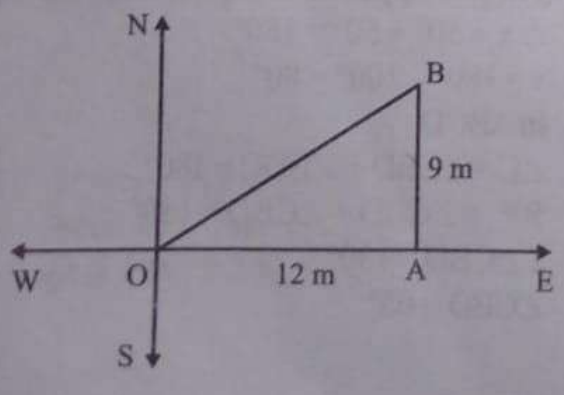
22. **(c)**

23. **(b)** $y + 150° = 180°$ (Co-interior angles)
$\Rightarrow y = 180° - 150° = 30$
also $z + (40 + y) = 180°$ (Co-interior angles)
$z = 180° - 40° - 30° = 110°$
Also $(x + z) + \angle CEB = 100°$
(Co-interior angles)
$x = 180° - 30° - 110° = 40°$
$\therefore x : y = 40° : 30° = 4 : 3$

24. **(b)** Let a be the length of the other side
$\therefore a^2 = (15)^2 - (9)^2$
$= 225 - 81$
$= 144 = (12)^2$
$\Rightarrow a = 12$ cm.
Hence, the length of the other side is 12 cm.

25. **(a)** (i) Here, $a = 15$ cm, $b = 20$ cm and $c = 25$ cm.
The largest side is $c = 25$ cm.
Now, $a^2 + b^2 = (15)^2 + (20)^2$
$= 225 + 400 = 625 = (25)^2$
$\therefore a^2 + b^2 = c^2$
Hence, given triangle is a right angled triangle.
(ii) Here $a = 7$ cm, $b = 6$ cm and $c = 13$ cm.
The largest side is $c = 13$ cm.
Now, $a^2 + b^2 = (7)^2 + (6)^2$
$= 49 + 36 = 85 \neq (13)^2$
$\Rightarrow a^2 + b^2 \neq c^2$

26. **(a)** Let O be the initial position of the man.
Finally, he reaches at the point B.



Now, in right ΔOAB, we have
$OB^2 = (OA^2 + AB^2) = 12^2 + 9^2$
$= 144 + 81 = 225 = (15)^2$
Hence, the man is at a distance of 15 m from his initial position.

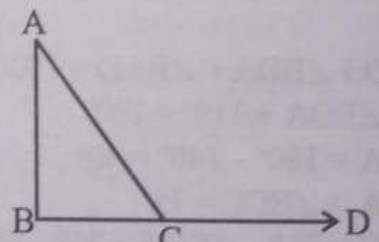
27. **(c)** $\angle ACD = \angle BAC + \angle ABC$
$\Rightarrow 120° = x + 50°$
$\Rightarrow x = (120° - 50°) = 70°$
In ΔABC
$\therefore x + 50° + y = 180°$
$\Rightarrow 70° + 50° + y = 180°$
$\Rightarrow y = (180° - 120°) = 60°$
Hence, $x = 70°$ and $y = 60°$

28. **(c)** Let the given interior opposite angles be $2x$ and $5x$.
$\therefore 2x + 5x = 140° \Rightarrow 7x = 140°$
$\Rightarrow x = 20°$
$\therefore$ One angle $= 2 \times 20 = 40°$
Other angle $= (5 \times 20°) = 100°$
Let the third angle be y.
$\therefore 40° + 100° + y = 180°$
$\Rightarrow y = (180° - 140°) = 40°$.
Hence, the angles of the triangle are 40°, 100° and 40°.

29. **(d)**

30. **(b)** (A) $\rightarrow$ (r); (B) $\rightarrow$ (p); (C) $\rightarrow$ (q); (D) $\rightarrow$ (s)
(A) In ΔABC, by angle sum property,
$\angle A + \angle B + \angle C = 180°$
$\angle C = 180° - 30° - 50° = 100°$

(B)



$\angle ACD = \angle ABC + \angle BAC$
$= 90° + 40° = 130°$

(C) In a right angled triangle greatest angle is the right angle i.e., 90°

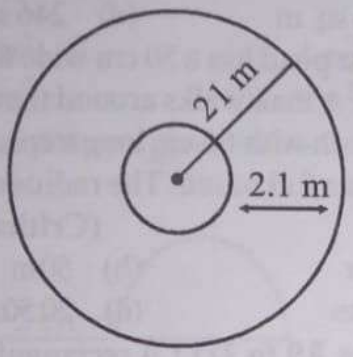
(D) In ΔABC, by angle sum property,
$\angle A + \angle B + \angle C = 180°$
$\Rightarrow \angle A + 2\angle A + 3\angle A = 180°$
$\Rightarrow x + 2x + 3x = 180°$

$\Rightarrow 6x = 180° \Rightarrow x = \frac{180°}{6°} = 30°$

LEVEL 2

1. If the ratio of the areas of two squares is 9 : 1 then the ratio of their perimeter is
   (a) 9:1 (b) 3:4
   (c) 3:1 (d) 1:3

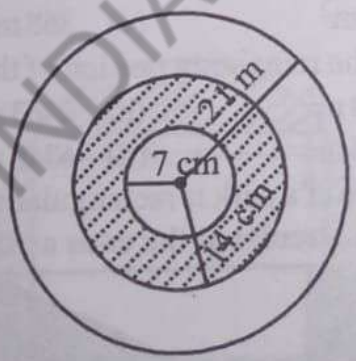
2. The diametre of a circular park is 42 m. A 2.1 m wide road runs inside it. Find the cost of constructing the road at ₹ 50 per m^2. **(2012)**



   (a) ₹ 13206 (b) ₹ 14216
   (c) ₹ 14206 (d) ₹ 13167

3. Area of four walls of a rectangular room is $77m^2$. The length and breadth of the room are 7.5 m and 3.5 m respectively. The height of the room is
   (a) 7.7m (b) 3.5m
   (c) 6.77m (d) 5.4m

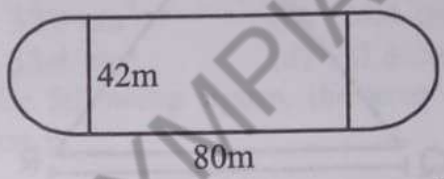
4. In the figure given below, a circle of diametre 42 cm is given. Inside this circle, two another circles with diametres 28 cm and 14 cm have been drawn. Find the area of the shaded portion. **(2012)**



   (a) 625 cm^2 (b) 462 cm^2
   (c) 635 cm^2 (d) 605 cm^2

5. A tin sheet is in the form of a rhombus whose side is 5 cm and one of its diagonals is 8 cm. Then the cost of painting the sheet at the rate of ₹ 3.50per cm^2 on both of its sides is
   (a) ₹ 84 (b) ₹ 140
   (c) ₹ 168 (d) none of these

6. A playground is in the form of a rectangle having semicircle on the shorter sides. Find its area when the length of the rectangular portion is 80 m and the breadth is 42 m. **(2011)**



   (a) 4746 m^2 (b) 4748 m^2
   (c) 4950 m^2 (d) 5049 m^2

7. How many bricks 20 cm by 10 cm will be needed to pave the floor of a room 25 m long and 16 m wide?
   (a) 18000 (b) 20000
   (c) 22000 (d) 24000

8. A marginal walk all around the inside of an oblong piece of ground 40 m by 35 m occupies 650 m^2. Find the width of the walk.
   (a) 3m (b) 4m
   (c) 5m (d) 6m

9. The length of a rectangular plywood sheet is thrice its breadth. If the cost of painting one side of the sheet at ₹ 14 per sq. m comes to ₹ 60.48, what is the length of the sheet in metres? **(2012)**
   (a) 4.32m (b) 1.44m
   (c) 2.4m (d) 3.6m

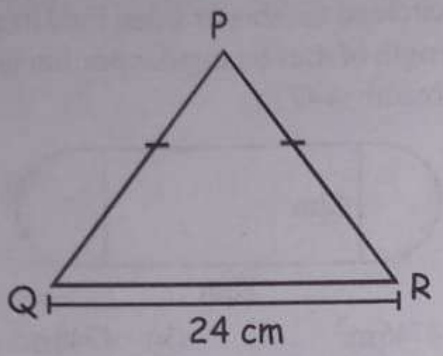
10. The perimeter of a circular plot is equal to that of a square plot. What is the ratio of their respective areas? **(2016)**
   (a) 13:11 (b) 14:11
   (c) 15:11 (d) 16:11

11. Four circles of radius 1 cm each are placed in such a way on a plane paper that each touches the other. Find the area (cm^2) of the space left in between the four circles. ($\pi = 3.16$)
   (a) 0.82 (b) 0.84
   (c) 0.86 (d) 0.88

12. The inside circumference of a circular field is 1188 m. A road 7 m wide is constructed on the outside. Find its area.
(a) $8070\,m^2$ (b) $8270\,m^2$
(c) $8370\,m^2$ (d) $8470\,m^2$

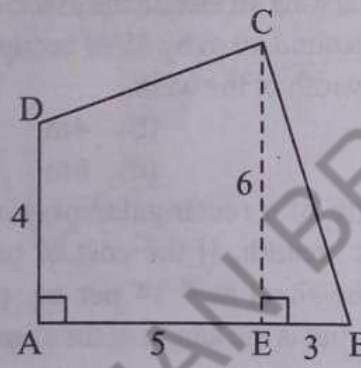
13. In the adjoining figure the base of an isosceles triangle is 24 cm and its area is $192\,cm^2$.

Then the perimeter of the triangle is
(2011, Critcal Thinking)



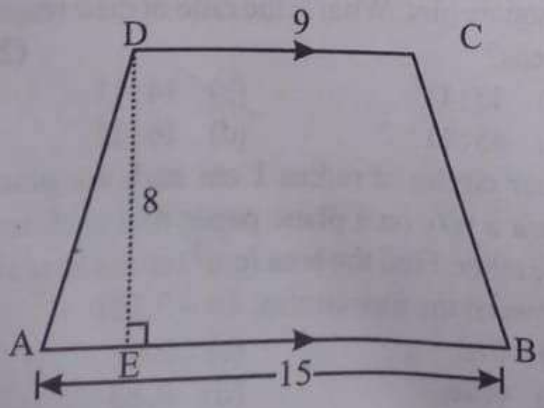
(a) 64 cm (b) 63 cm
(c) 62 cm (d) 61 cm

14. In the figure, AD = 4 cm, CE = 6 cm, AE = 5 cm and BE = 3 cm. The area of the quadrilateral ABCD is:



(a) $24\,cm^2$ (b) $34\,cm^2$
(c) $72\,cm^2$ (d) $48\,cm^2$

15. In the figure, ABCD is a trapezium in which AB = 15 cm, DC = 9 cm and DE = 8 cm. The area of ABCD is:



(a) $128\,cm^2$ (b) $25\,cm^2$
(c) $96\,cm^2$ (d) $216\,cm^2$

16. A 7 m wide path is to be constructed all around, and outside a circular garden of diameter 112 m. The cost of constructing the path at Rs. 50 per square metre is
(a) Rs. 13090 (b) Rs. 130900
(c) Rs. 1309 (d) Rs. 13000

17. The radius of a circular sheet of metal is 14 m. A circular piece of sheet is cut out from its centre. This piece has a radius of 7 m. The area of the sheet left is
(a) 462 sq. m (b) 642 sq. m
(c) 426 sq. m (d) 246 sq. m

18. A circular pond has a 50 cm wide footpath along the edge. A man walks around the outer edge of the footpath with 66 cm long steps. In 200 steps, he makes a full round. The radius of the pond is
(Critical Thinking)
(a) 20 m (b) 50 m
(c) 20 cm (d) 20.50 m

Directions (Qs. 19 to 22) : A rectangular park is of dimensions 90 m by 80 m. Four paths pass through the park such that two paths each width 2 m are parallel to the breadth and two paths each of width 3 m are parallel to the length.

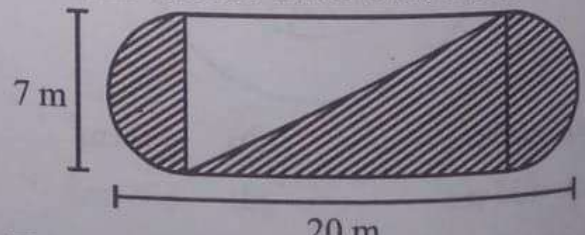
19. Total area of the two roads along the length is
(a) $270\,m^2$ (b) $810\,m^2$
(c) $540\,m^2$ (d) $504\,m^2$

20. Total area of the two roads along the breadth is
(a) $320\,m^2$ (b) $160\,m^2$
(c) $230\,m^2$ (d) $270\,m^2$

21. Total area of the four roads is
(a) $386\,m^2$ (b) $836\,m^2$
(c) $863\,m^2$ (d) $368\,m^2$

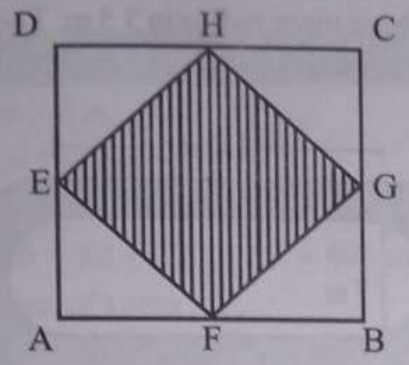
22. Area of the remaining portion of the park is
(a) $6364\,m^2$ (b) $6463\,m^2$
(c) $6634\,m^2$ (d) $6346\,m^2$

23. The shape of a park is rectangular at the middle and semi-circular at the ends as shown below.



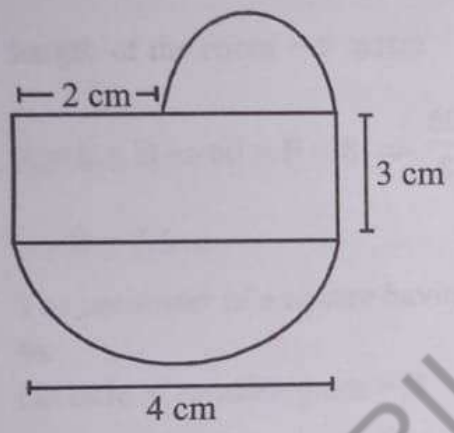
The area of shaded portion is
(a) $84\,cm^2$ (b) $85\,cm^2$
(c) $45\,cm^2$ (d) $88\,cm^2$

24. Area of shaded square formed by the joining the mid-points of the sides of a square with area $16\,m^2$ is **(2017, Tricky)**



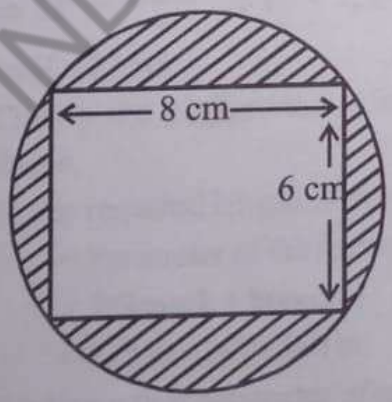
(a) $16\,m^2$ (b) $4\,m^2$
(c) $10\,m^2$ (d) $8\,m^2$

25. The area of shape given below is



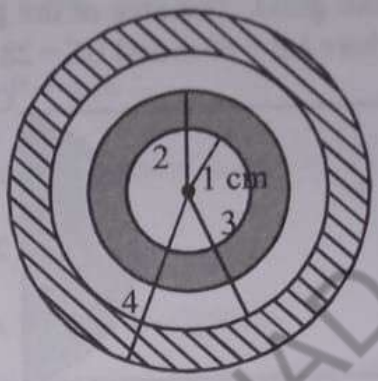
(a) $20\,cm^2$ (b) $19.9\,cm^2$
(c) $18\,cm^2$ (d) $17\,cm^2$

26. The area of shaded region of the figure given below is **(2011)**



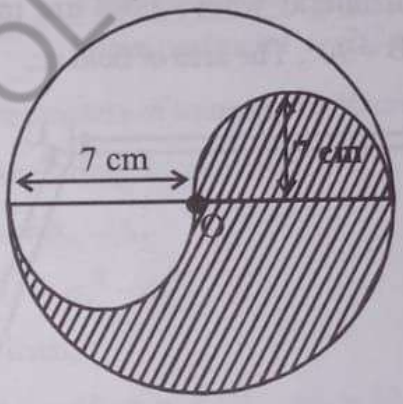
(a) $78.5\ cm^2$ (b) $30.5\ cm^2$
(c) $42.8\ cm^2$ (d) $47\ cm^2$

27. In the following figure, the area of shaded region is **(Critical Thinking)**



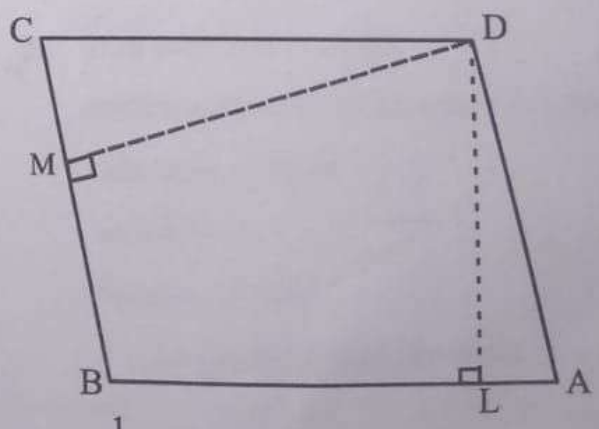
(a) $32.2\ cm^2$ (b) $24.4\ cm^2$
(c) $35.4\ cm^2$ (d) $31.4\ cm^2$

28. In the following figure, the area of shaded region is



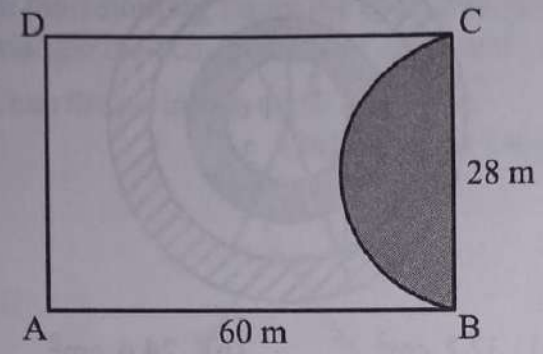
(a) $75\ cm^2$ (b) $77\ cm^2$
(c) $\frac{231}{4}cm^2$ (d) $\frac{77}{4}cm^2$

29. In the given fig. ABCD is a parallelogram. DL $\perp$ AB and DM $\perp$ BC. If AB = 18 cm, BC = 12 cm and DM = 10 cm. Find DL.



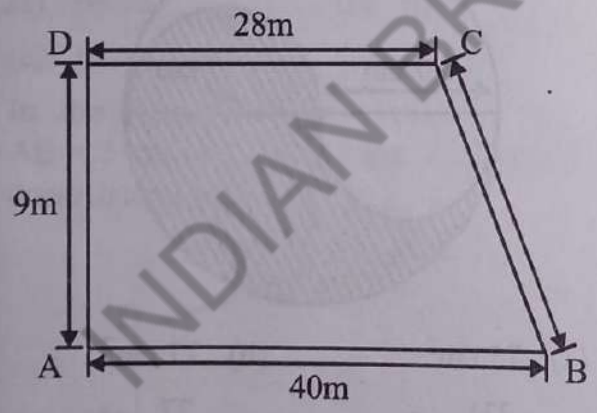
(a) $6\frac{1}{2}cm$ (b) 6 cm
(c) $6\frac{2}{3}cm$ (d) None of these

30. A plot is in the form of a rectangle ABCD having semi-circle on BC as shown in figure. The semi-circle portion is grassy while the remaining plot is without grass. The area of the plot without grass where AB = 60 m and BC = 28 m is :



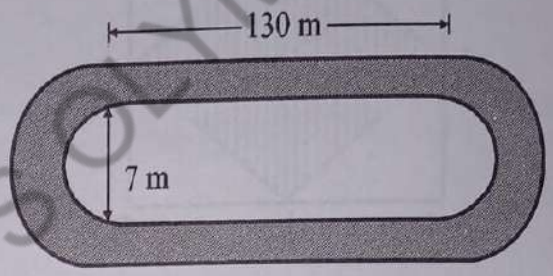
(a) 3722 m^2 (b) 1372 m^2
(c) 926 m^2 (d) None of these

31. In the given figure, ABCD is a field in the form of a quadrilateral whose sides are indicated. If ∠DAB = 90°. The area of field is :



(a) 306 m^2 (b) 307 m^2
(c) 308 m^2 (d) 309 m^2

32. An athletic track 14 m wide consists of two straight sections 130 m long joining semicircular ends whose inner radius in 3.5 m. The area of the shaded region is :



(a) 4564 m^2 (b) 5566.04 m^2
(c) 99909 m^2 (d) None of these

$= \sqrt{78\times37\times39\times74}\ m^2$

$= 37 \times 39 \times 2\ m^2$

$= 2886\ m^2$

48. (d) Here, the area of rhombus = A = 4800 m^2

Side of rhombus = a = 40 m

One diagonal, d_1 = ?

Second diagonal, d_2 = ?

Using the correlation formula,

$(d_1 + d_2)^2 = 4(a^2 + A)$ and

$(d_1 - d_2)^2 = 4(a^2 - A)$

$\Rightarrow (d_1 + d_2)^2 = 4[(80)^2 + 4800]$

$\Rightarrow d_1 + d_2 = 2\sqrt{6400 + 4800}$ ... (i)

$\Rightarrow d_1 + d_2 = 212.6$

Similarly, $(d_1 - d_2)^2 = 4[(80)^2 - 4800]$

$\Rightarrow d_1 + d_2 = 2\sqrt{1600}$ ... (ii)

$\Rightarrow d_1 + d_2 = 80$

Solving (i) and (ii),

d_1 = 145.83 m; d_2 = 65.83 m

49. (a) Length (l) = 25 m, breadth (b) = 10 m, height (h) = 2 m

Surface area = 2 ($lb + bh + lh$)

Surface area = 2 ($25 \times 10 + 10 \times 2 + 25 \times 2$)

= 2 (250 + 20 + 50)

surface area = 640 m^2

Volume of cuboid = $l \times b \times h$ = $25 \times 10 \times 2$

Volume of cuboid = 500 m^3

Length of diagonal 'd' $= \sqrt{\ell^2 + b^2 + h^2}$

$= \sqrt{(25)^2 + (10)^2 + (2)^2} = \sqrt{625 + 100 + 4}$

$= \sqrt{729} = 27$ m

50. (b) Let each side of cube be 'a'

$\therefore$ surface area of cube = $6a^2$

$6a^2 = 216$

$\Rightarrow a^2 = 36$

$\Rightarrow a = 6$ cm

Volume of cube = a^3 cm^3 = $(6)^3 = 216$ cm^3

LEVEL – 2

1. (c) Let the areas of two square be $9x^2$ and x^2 respectively. Then the sides of them will be $\sqrt{9x^2}$ and $\sqrt{x^2}$, i.e, 3x and x respectively.

Hence, the ratio of their perimeter

$= \frac{4\times3x}{4\times x} = 3:1$

2. (d) Area of road = outer circle are – Inner circle area

$= \pi r^2 - \pi r^2 = \pi[21^2 - (21-2.1)^2]$

$= \frac{22}{7}[441 - (18.9)^2] = \frac{22}{7}[441 - 357.21]$

$= \frac{22}{7} \times 83.79 = 263.34\ m^2$

cost of constructing the road

= ₹ 263.34 × 50 = ₹ 13167

3. (b) Let h be the height of the room in metre, then

Area of four walls

= 2(length + breadth) × h

$77 = 2(7.5 + 3.5) \times h$

$\Rightarrow h = \frac{77}{2\times11} \Rightarrow h = 3.5$ m.

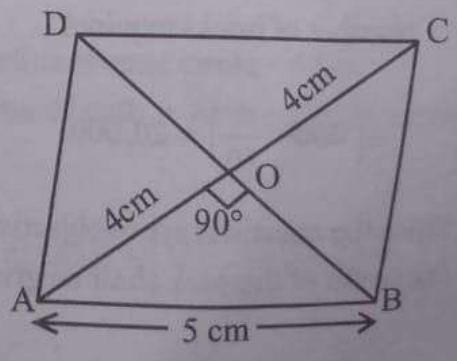
4. (b) Area of shaded portion

$= \pi r^2 - \pi r^2 = \pi[R^2 - r^2]$

$= \frac{22}{7}[14^2 - 7^2] = \frac{22}{7}[196 - 49]$

$= \frac{22}{7} \times 147 = 462\ cm^2$

5. (c)



Diagonals of a rhombus bisect each other at 90°.

In ΔOAB, $OB = \sqrt{5^2 - 4^2} = 3\,cm$

$\therefore$ $BD = 2 \times OB = 2 \times 3 = 6\,cm$

$\therefore$ Area of $ABCD = \frac{1}{2} \times 8 \times 6 = 24\,cm^2$

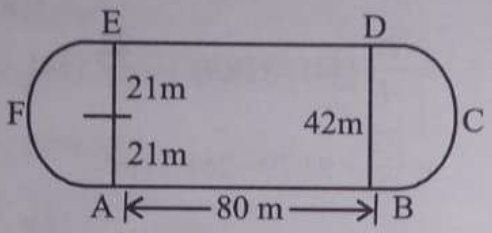
Now, the cost of painting

$= 2 \times 3.50 \times$ area of rhombus ABCD

$= 2 \times 3.50 \times 24$

$= ₹\ 168$

6. (a)



Radius of each of semi-circle

$= \frac{42}{2} = 21\,m$

The required area = 2 × area of semi-circle EFA + area of rectangle ABDE

$= 2 \times \frac{1}{2}\pi(21)^2 + 80 \times 42$

$= \frac{22}{7} \times 21 \times 21 + 80 \times 42 = 4746\,m^2.$

7. (b) Area of the room $= 25\,m \times 16\,m$

$= 400\,m^2$

Area of the brick $= 20\,cm \times 10\,cm$

$= \frac{1}{5}m \times \frac{1}{10}m = \frac{1}{50}m^2$

$\therefore$ Number of bricks required

$= \left(400 \div \frac{1}{50}\right) = 20,000.$

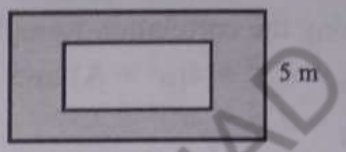
8. (c) Since the questions are of objective nature, the width of the park shall be given in the choice. If one of the choices be 5 metres, then it will satisfy the given condition.

Shaded area $= 650\,m^2$

External area $= 40 \times 35 = 1400 m^2$

Internal area $= (40 - 2 \times 5)(35 - 2 \times 5)$

$= (30 \times 25)m^2 = 750 m^2$



$\therefore$ Shaded are $= (1400 - 750)m^2$

$= 650\,m^2$

Which is true.

Hence, width of the walk is 5 m.

9. (d) Let breadth of sheet = B

then length of sheet = 3 × B

Area of plywood A = L × B = 3B × B

Now,

$\text{Area} = \frac{\text{Total cost}}{\text{Cost per m-sq.}}$

$3B^2 = \frac{60.48}{14} \quad \Rightarrow B^2 = \frac{60.48}{42} = 1.44$

B = 1.2

L = 3 × 1.2 = 3.6 cm

10. (b) Let 4x be the perimeter of the square, so that its area is x^2. Circumference $= 2\pi r = 4x$

$\therefore$ $r = \frac{2x}{\pi}$

$\therefore$ $\text{Area} = \pi r^2 = \pi\left(\frac{2x}{\pi}\right)^2 = \pi\frac{4}{\pi^2}x^2$

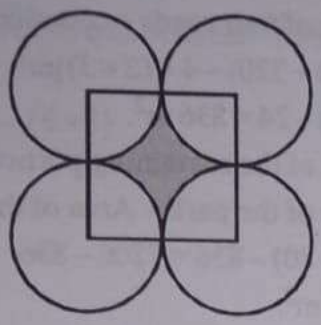
$\therefore$ Ratio of area of the circle and the square

$= \frac{4}{\pi}x^2 : x^2$

$= 4 : \pi$ or $4 : \frac{22}{7}$

$= 28 : 22$ or $14 : 11.$

11. (b) Shaded area = Area of the square of side 2 cm – Area of the four quadrants of circle of radius 1 cm



i.e., Shaded area

$$= 2^2 - 4 \times \frac{1}{4} \times \pi.1^2$$

$$= (4 - \pi)\ cm^2$$

$$= (4 - 3.16)\ cm^2$$

$$= 0.84\ cm^2$$

12. (d) $2\pi r = 1188$

$$r = \frac{1188}{22 \times 2} \times 7 = 189\,m$$

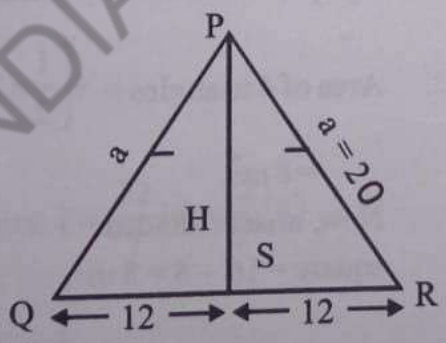
So outer radius

$R = 189 + 7 = 196$ m

So area of road = $\pi(R^2 - r^2)$

Put R =196 m and r = 189 m and proceed.

13. (a)



Total Area = Area ΔPQR + Area PSR

$$\Rightarrow 192 = \frac{1}{2} \times 12 \times H + \frac{1}{2} \times 12 \times H$$

$$\Rightarrow 192 = 12H$$

$$\Rightarrow H = \frac{192}{12} = 16$$

$$a^2 = 144 + 256 \Rightarrow a^2 = 400$$

$(a = 20)$ P = 64 cm

14. (b) Area of ABCD = Area of trapezium AECD + Area of ΔBCE

$$= \left[\frac{1}{2} \times (4+6) \times 5 + \frac{1}{2} \times 3 \times 6\right]$$

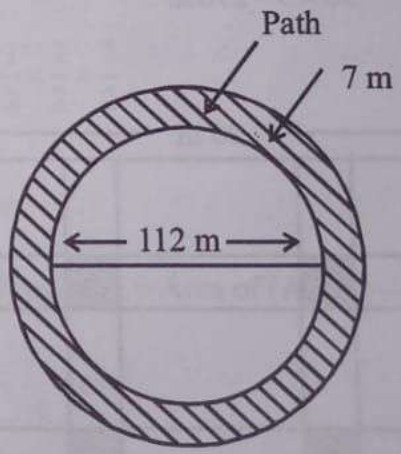
$= 25 + 9 = 34\ cm^2$.

15. (c) Area of trapezium ABCD

$$= \frac{1}{2} \times (AB + DC) \times DE$$

$$= \frac{1}{2} \times (9 + 15) \times 8 = 96\ cm^2$$

16. (b)



Radius of inner circle = $\frac{112}{2} = 56$m

Radius of outer circle = 63 m

Area of path = Area of outer circle – Area of inner circle

$$= \pi\left[(63)^2 - (56)^2\right] = \frac{22}{7} \times 119 \times 7$$