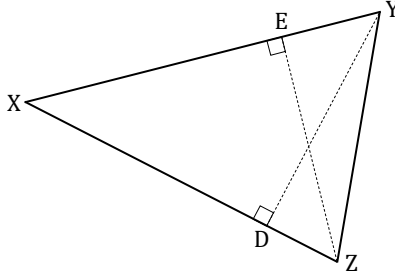


Area of a Triangle

1. In the figure below, XYZ is a triangle.

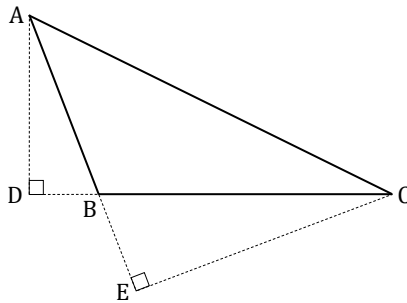


When XZ is the base, what is the height of Triangle XYZ ?

- (1) DY
- (2) EZ
- (3) XY
- (4) YZ

()

2. In the figure below, ABC is a triangle.



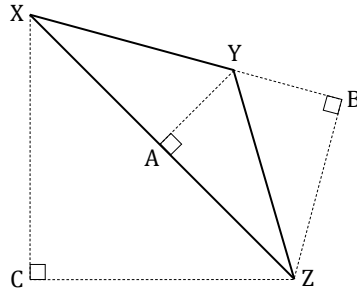
Given that EC is the height, what is the base of Triangle ABC ?

- (1) AB
- (2) AC
- (3) AD
- (4) AE

()



3. In the figure below, XYZ is a triangle.

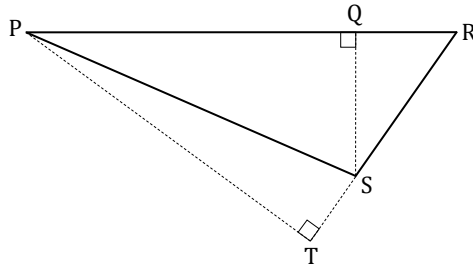


Given that XY is the base, what is the height of Triangle XYZ?

- (1) AY
- (2) CX
- (3) BZ
- (4) YZ

()

4. In the figure below, PRS is a triangle.



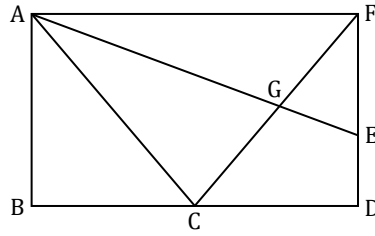
Which of the following pairs shows the correct base and its corresponding height for finding the area of Triangle PRS?

- | | Base | Height |
|-----|------|--------|
| (1) | TR | PT |
| (2) | SR | PS |
| (3) | PQ | SQ |
| (4) | PR | QS |

()



5. The figure below shows a rectangle ABDF.

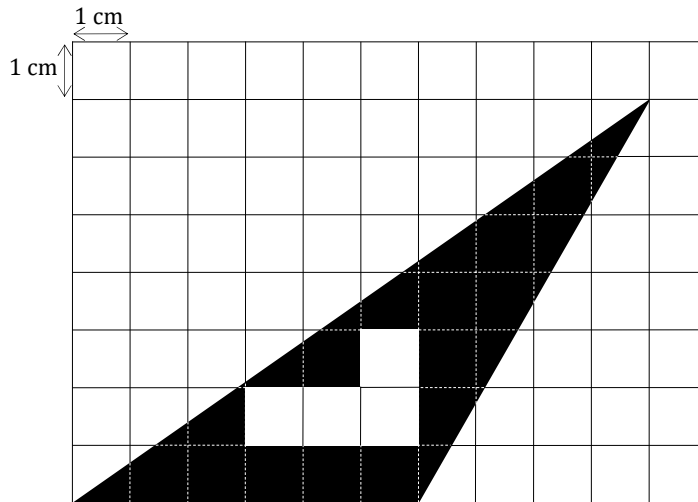


Which one of the following pairs of triangles has the same height?

- (1) Triangle ABC and Triangle EFG
- (2) Triangle AEF and Triangle CAG
- (3) Triangle CAB and Triangle AGF
- (4) Triangle CAF and Triangle CDF

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6. Find the shaded area in the figure below.

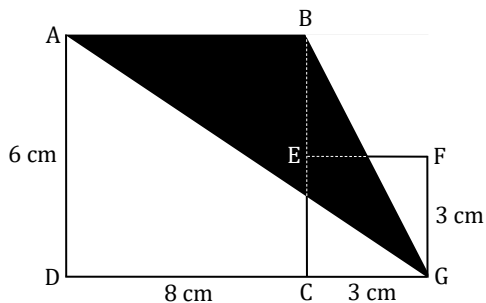


- (1) 17 cm^2
- (2) 21 cm^2
- (3) 38 cm^2
- (4) 42 cm^2

()



7. In the figure below, ABCD is a rectangle and CEFG is a square.

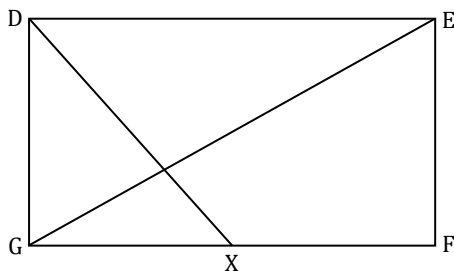


Find the area of Triangle ABG.

- (1) 9 cm^2
- (2) 24 cm^2
- (3) 33 cm^2
- (4) 48 cm^2

()

8. In the figure below, DEFG is a rectangle and $GX = XF$.

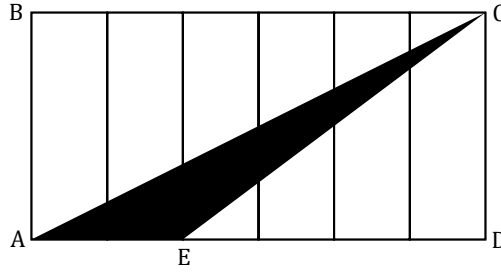


What is the ratio of the area of Triangle DGX to the area of Triangle DGE?

- (1) 1 : 2
- (2) 1 : 3
- (3) 2 : 1
- (4) 3 : 1

()

9. The figure ABCD is made up of 6 identical rectangles. ACE is a triangle.

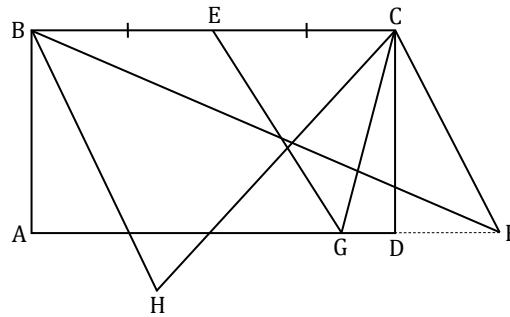


What fraction of the figure ABCD is shaded?

- (1) $\frac{1}{12}$
- (2) $\frac{1}{6}$
- (3) $\frac{1}{2}$
- (4) $\frac{1}{3}$

()

10. The figure below shows a rectangle ABCD.



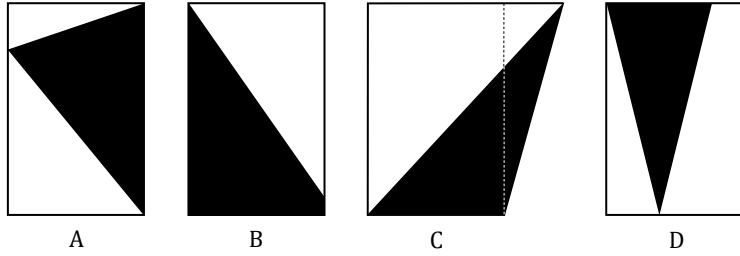
Which of the following triangles has an area that is half of Rectangle ABCD?

- (1) BCF
- (2) BCH
- (3) CFG
- (4) ECG

()



11. The figures below show 4 identical rectangles.

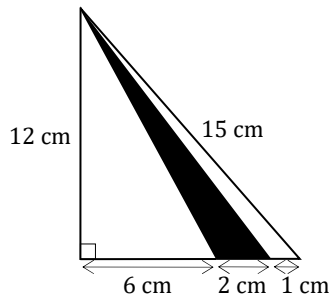


Which two of the shaded figures have the same area?

- (1) A and B
- (2) A and C
- (3) B and D
- (4) C and D

()

12. The figure below shows a triangle with a shaded region.



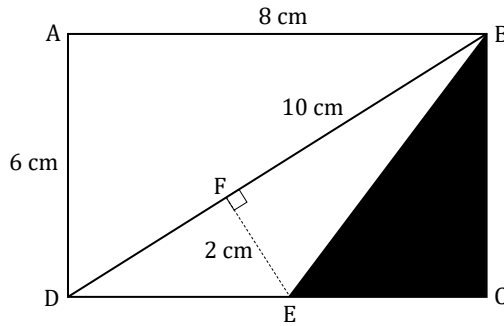
Find the area of the shaded region.

- (1) 12 cm^2
- (2) 36 cm^2
- (3) 42 cm^2
- (4) 84 cm^2

()



13. The figure below shows Rectangle ABCD. AB is 8 cm, AD is 6 cm and BD is 10 cm. EF is 2 cm and is perpendicular to BD.

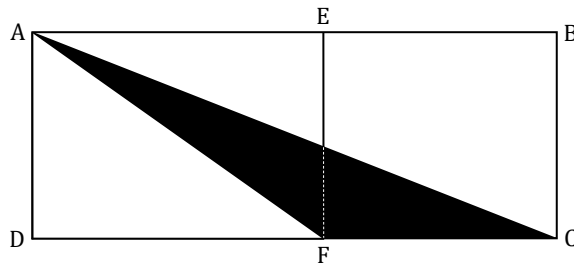


Find the shaded area.

- (1) 12 cm^2
- (2) 14 cm^2
- (3) 24 cm^2
- (4) 38 cm^2

()

14. The figure below shows Triangle ACF and Rectangles ADFE and EFCB.



Who made a correct statement about the area of Triangle ACF?

Nadia: The area of Triangle ACF is the same as the area of Rectangle ABCD.

Jeremy: The area of Triangle ACF is half the area of Rectangle ABCD.

Amanda: The area of Triangle ACF is the same as the area of Rectangle EFCB.

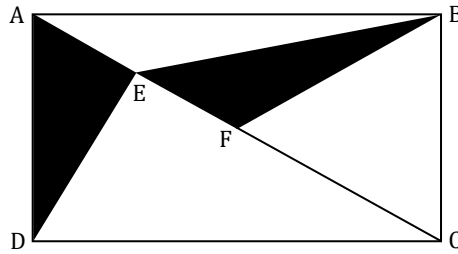
Bernard: The area of Triangle ACF is half the area of Rectangle EFCB.

- (1) Nadia
- (2) Jeremy
- (3) Amanda
- (4) Bernard

()



15. The figure below shows Rectangle ABCD. F is the mid-point of AC and E is the mid-point of AF.



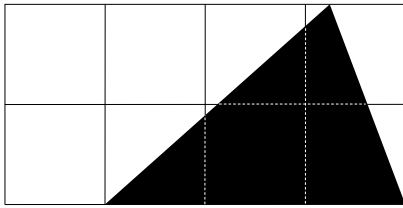
If the total shaded area is 120 cm^2 , find the area of Rectangle ABCD.

- (1) 240 cm^2
- (2) 300 cm^2
- (3) 360 cm^2
- (4) 480 cm^2

()

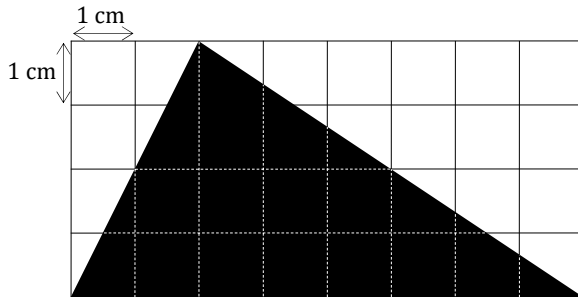


16. The figure below is made up of 8 identical squares. What fraction of the figure is shaded? Express your answer in its simplest form.



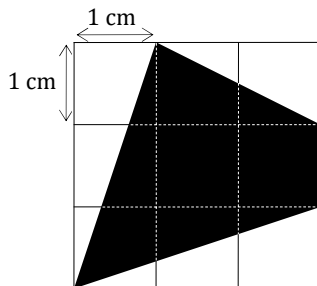
Ans: _____

17. Find the area of the shaded triangle in the square grid below.



Ans: _____ cm²

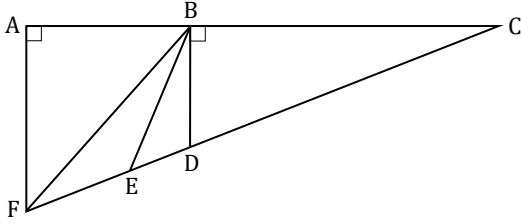
18. Find the area of the shaded region below.



Ans: _____ cm²

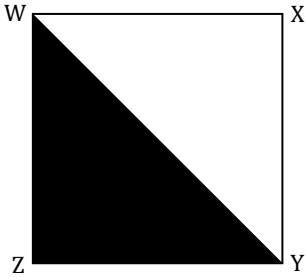


19. Name the height of Triangle BCF.



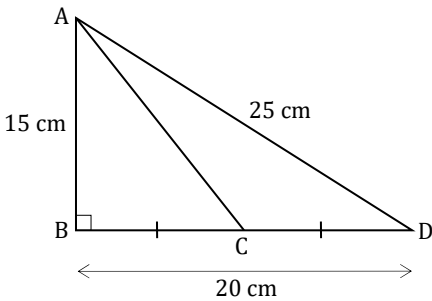
Ans: _____

20. In the figure below, WXYZ is a square and WYZ is a triangle. The perimeter of WXYZ is 128 cm. Find the area of Triangle WYZ.



Ans: _____ cm²

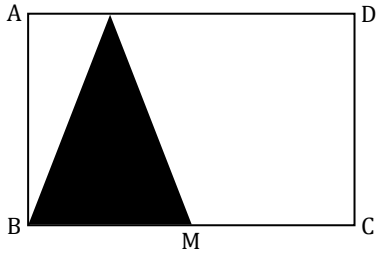
21. The figure below is made up of Triangle ABC and Triangle ACD. Find the area of Triangle ACD.



Ans: _____ cm²

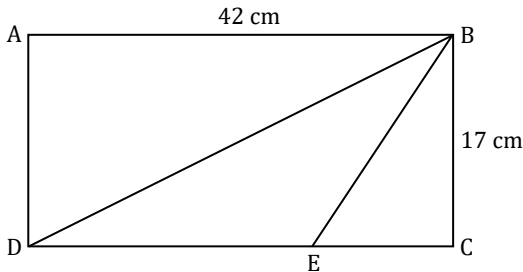


22. In the figure below, ABCD is a rectangle and $BM = MC$. Express the area of the shaded part to the area of the unshaded part as a ratio in the simplest form.



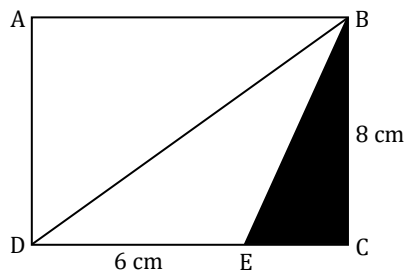
Ans: _____

23. ABCD is a rectangle. $AB = 42$ cm and $BC = 17$ cm. The ratio of the length of DE to the length of EC is $2 : 1$. What is the area of Triangle DBE?



Ans: _____ cm^2

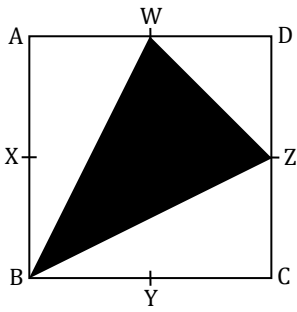
24. ABCD is a rectangle. The perimeter of ABCD is 34 cm. The length of DE is 6 cm. The length of BC is 8 cm. Find the area of the shaded part.



Ans: _____ cm^2

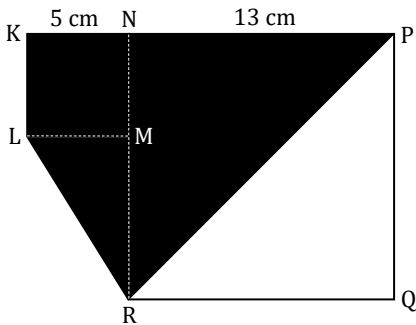


25. W, X, Y and Z are the mid-points of the sides of a square ABCD. The area of the square is 64 cm^2 . What is the area of the shaded triangle?



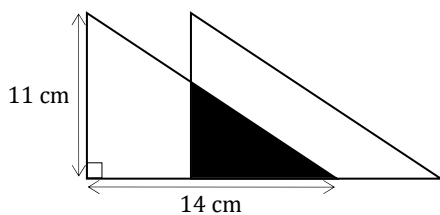
Ans: _____ cm^2

26. In the figure below, KLMN and NRQP are squares. The length of KN is 5 cm and the length of NP is 13 cm. Find the total area of the shaded parts.



Ans: _____ cm^2

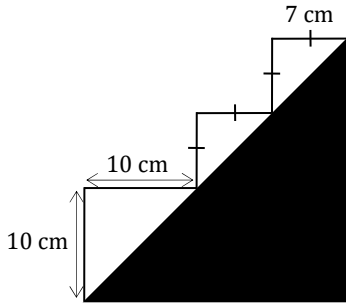
27. The figure below shows two identical triangles with an overlapped area. Given that the overlapped area is 32 cm^2 , find the area of the whole figure.



Ans: _____ cm^2

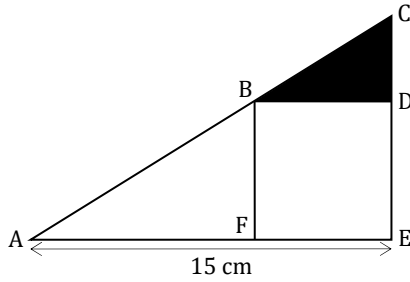


28. Find the area of the shaded triangle.



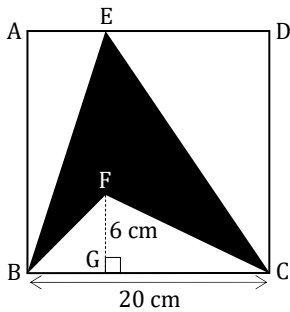
Ans: _____ cm^2

29. The area of Triangle ACE is 75 cm^2 . The area of Square BDEF is 36 cm^2 . The length of AE is 15 cm. Find the shaded area.



Ans: _____ cm^2

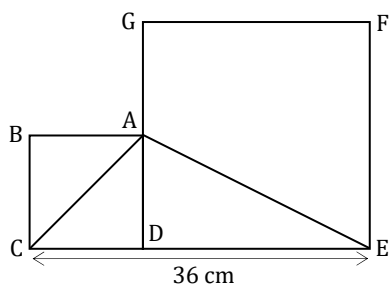
30. ABCD is a square. The length of BC is 20 cm and the length of FG is 6 cm. Find the shaded area.



Ans: _____ cm^2

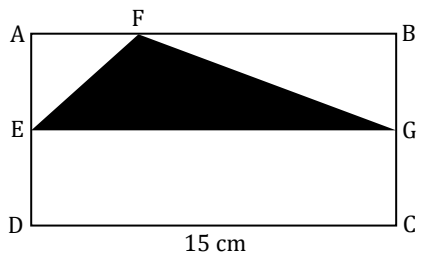


31. The figure below is made up of 2 squares. The length of CE is 36 cm and DE is twice as long as CD. Find the area of Triangle ACE.



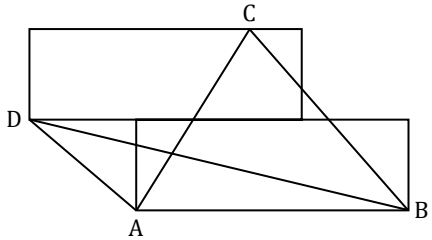
Ans: _____ cm²

32. In the figure below, ABCD is a rectangle and the area of Triangle EFG is 30 cm². AE is $\frac{1}{2}$ of AD. Find the length of AD.



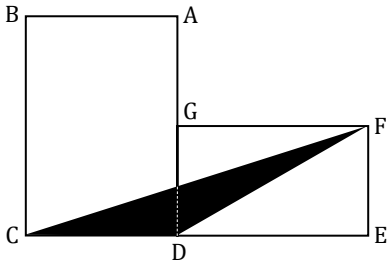
Ans: _____ cm

33. The figure below is made up of Triangle ABC, Triangle ABD and 2 identical rectangles. The area of Triangle ABC is 36 cm². What is the area of Triangle ABD?



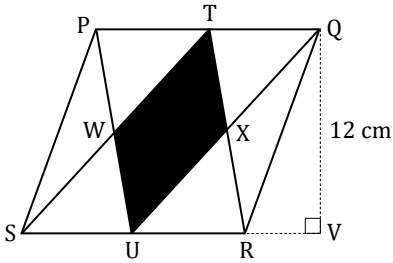
Ans: _____ cm²

34. ABCD and DEFG are rectangles. The area of Triangle CDF is 24 cm^2 and $AG = GD$. Find the area of Rectangle ABCD.



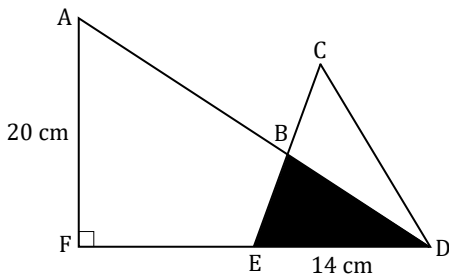
Ans: _____ cm^2

35. PQRS is a rhombus of sides 13 cm. Points T and U are the mid-points of lines PQ and SR respectively. The length of QV is 12 cm. Find the area of the shaded region.



Ans: _____ cm^2

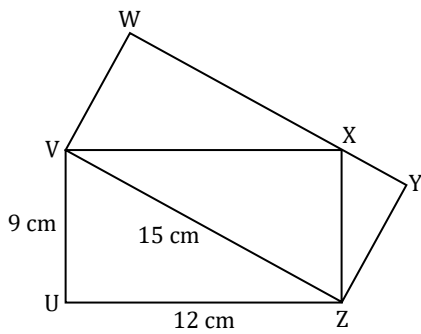
36. The figure ABCDEF is made up of two triangles ADF and CDE. The area of the shaded triangle BDE is 96 cm^2 , which is half of the area of Triangle CDE. $FE = ED = 14 \text{ cm}$. What is the total area of the figure ABCDEF?



Ans: _____ cm^2

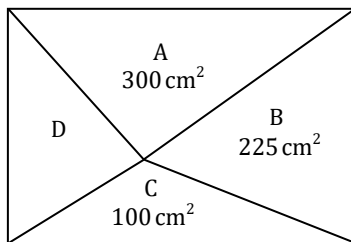


37. In the figure below, UVXZ and VWYZ are rectangles. $VU = 9\text{ cm}$, $UZ = 12\text{ cm}$ and $VZ = 15\text{ cm}$. Find the length of YZ.



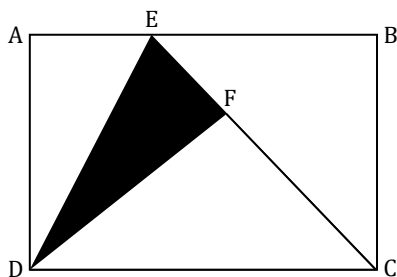
Ans: _____ cm

38. In the figure below, the rectangle is divided into 4 triangles. The areas of Triangles A, B and C are 300 cm^2 , 225 cm^2 and 100 cm^2 respectively. Find the area of Triangle D.



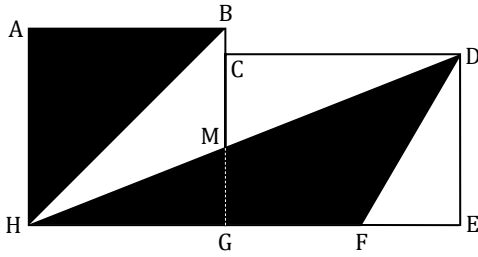
Ans: _____ cm^2

39. The area of Rectangle ABCD is 560 cm^2 . The area of Triangle CDF is 160 cm^2 . Find the area of the shaded triangle DEF.



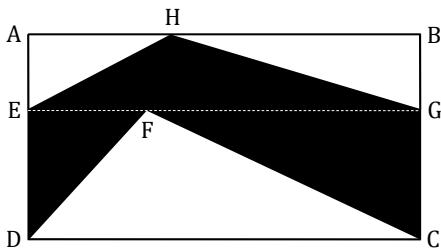
Ans: _____ cm^2

40. The figure below is made up of Square ABGH and Rectangle CDEG. Each side of Square ABGH is 8 cm. $BC = 1$ cm, $CD = 10$ cm and $FE = 4$ cm. HMD and HGFE are straight lines. Find the total area of the shaded parts.



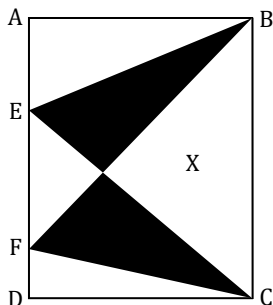
Ans: _____ cm^2

41. The figure below shows a rectangle ABCD. EG is a straight line parallel to AB. AD is thrice of AE. The area of Triangle CDF is 32 cm^2 . Find the shaded area.



Ans: _____ cm^2

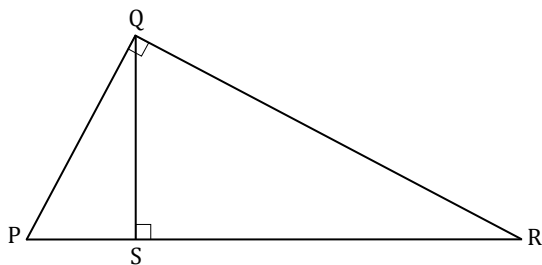
42. The figure below is made up of Rectangle ABCD and 2 overlapping triangles BEC and BFC. The total area of the shaded parts is 150 cm^2 . If the area of Rectangle ABCD is 600 cm^2 , find the area of the unshaded part X.



Ans: _____ cm^2



43. The figure below is made up of triangles. PR is a straight line.

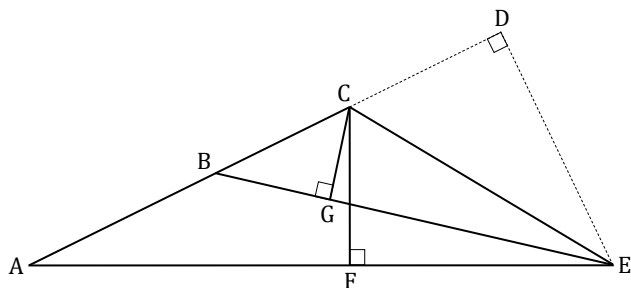


Each statement below is either true, false or not possible to tell from the information given. For each statement, put a tick (✓) in the correct column.

Statement	True	False	Not possible to tell
The line QS can be the height of both Triangle QRS and Triangle PQS.			
If the base of Triangle PQR is PR, the height is PQ.			

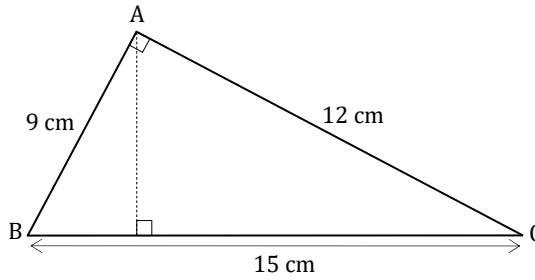
44. Study the figure below and answer the following questions.

- (a) DE is the height of Triangle ACE. Name the line that represents the base of the same triangle.
- (b) AE is the base of Triangle ACE. Name the line that represents the height of the same triangle.



Ans: (a) _____
 (b) _____

45. Triangle ABC is shown below.



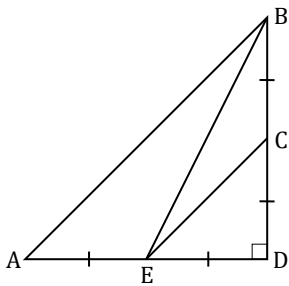
Each statement below is either true, false or not possible to tell from the information given. For each statement, put a tick (✓) in the correct column.

Statement	True	False	Not possible to tell
The area of Triangle ABC is 90 cm^2 .			
When the height and base of Triangle ABC is doubled, the area of the new triangle is also doubled.			

46. Triangle ABD is made up of Triangle ABE, Triangle BEC and Triangle CED. The area of Triangle BED is 16 cm^2 .

(a) What is the area of Triangle ABE?

(b) What is the area of Triangle EBC?

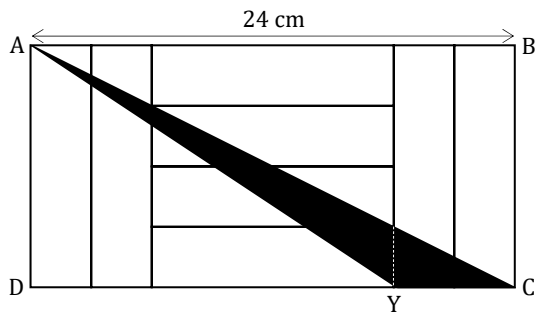


Ans: (a) _____ cm^2

(b) _____ cm^2

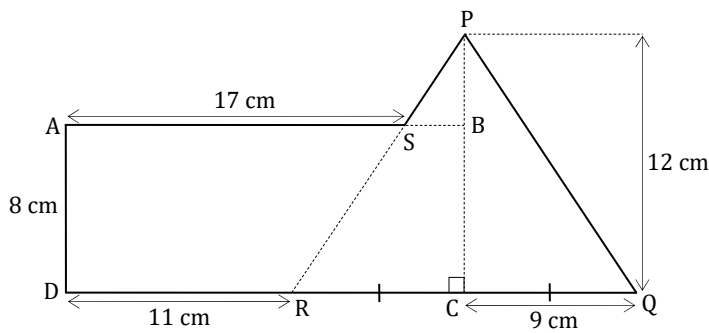


47. In the figure below, Rectangle ABCD is made up of 8 smaller identical rectangles. Given that $AB = 24$ cm, what is the area of Triangle ACY?



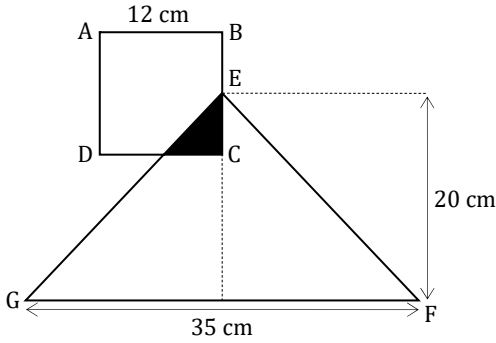
Ans: _____ cm^2

48. ABCD is a rectangle and PQR is a triangle with $RC = CQ$. Find the area of the figure ASPQD.



Ans: _____ cm^2

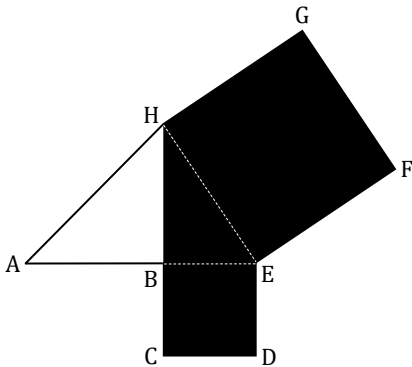
49. In the figure below, ABCD is a square and EFG is a triangle. $\frac{1}{8}$ of the square is shaded. Find the unshaded area of Triangle EFG.



Ans: _____ cm²

50. The figure below is made up of two squares and two triangles. The area of Square BCDE is 25 cm², the area of Square EFGH is 169 cm² and the area of the isosceles triangle ABH is 72 cm². AB=BH. ABE and HBC are straight lines.

- (a) Find the area of Triangle BHE.
- (b) Find the perimeter of the shaded area.

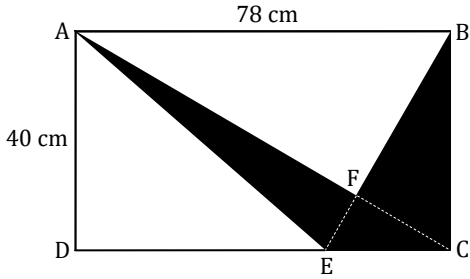


Ans: (a) _____ cm²

(b) _____ cm



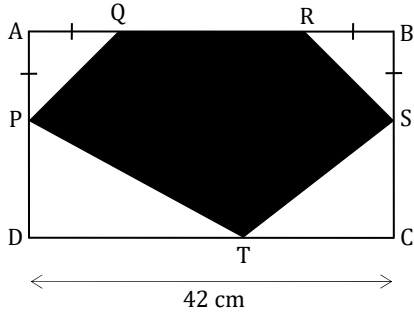
51. In the figure below, ABCD is a rectangle. AFC and BFE are straight lines. The area of Triangle CEF is 130 cm^2 . The length of EC is half the length of DE. What is the total area of the shaded region?



Ans: _____ cm^2

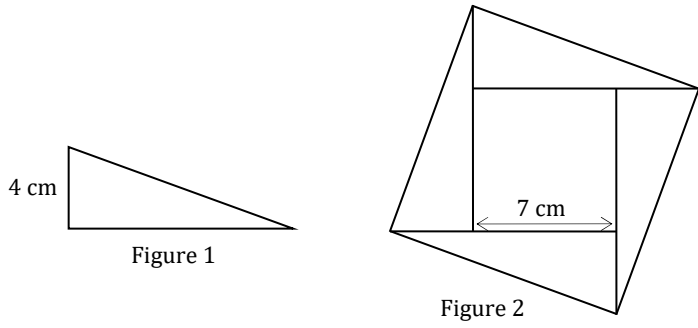
52. In the figure below, ABCD is a rectangle. The length of the rectangle is twice its breadth. The ratio of the length of AP to the length of AD is 3 : 7.

- (a) Find the length of AD.
- (b) Find the area of the shaded region.



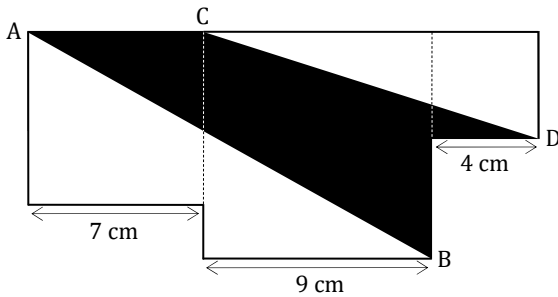
Ans: (a) _____ cm
 (b) _____ cm^2

53. Figure 1 is a right-angled triangle with one of the sides as 4 cm. Figure 2 is made up of 4 such right-angled triangles and a square. Find the area of Figure 2.



Ans: _____ cm^2

54. In the figure below, there are 3 squares of sides 7 cm, 9 cm and 4 cm. AB and CD are straight lines. Find the shaded area.



Ans: _____ cm^2



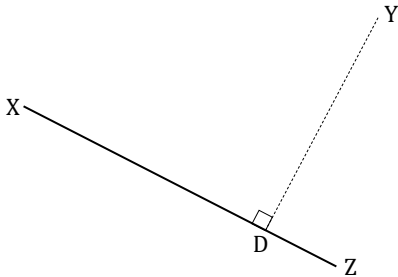
3

Area of a Triangle

Solution 1

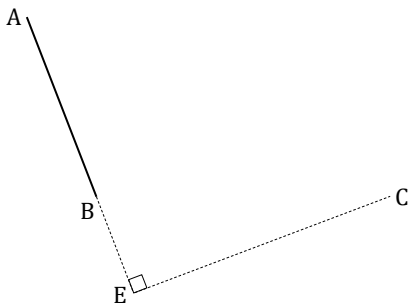
1

The height of a triangle is perpendicular to its base. DY is perpendicular to XZ .

**Solution 2**

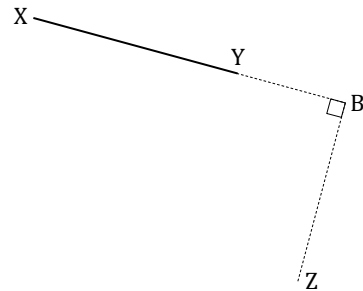
1

The height of a triangle is perpendicular to its base. AB extended is perpendicular to EC .

**Solution 3**

3

The height of a triangle is perpendicular to its base. BZ is perpendicular to XY extended.

**Solution 4**

4

Option 1:
Incorrect. Base TR and height PT are used for finding the area of Triangle PRT .

Option 2:
Incorrect. PS is not perpendicular to SR .

Option 3:
Incorrect. Base PQ and height SQ are used for finding the area of Triangle PQS .

Solution 5

4

For Triangle CAF , the height is FD and the base is AF .

For Triangle CDF , the height is FD and the base is CD .



Solution 6

1

$$\begin{aligned} \text{Area of the whole triangle} &= \frac{1}{2} \times 6 \times 7 \\ &= 21 \text{ cm}^2 \end{aligned}$$

$$\text{Area of the shaded figure} = 21 - 4 = 17 \text{ cm}^2$$

Solution 7

2

$$\text{Area of Triangle ABG} = \frac{1}{2} \times 8 \times 6 = 24 \text{ cm}^2$$

Solution 8

1

$$\text{Area of Triangle DGX} = \frac{1}{2} \times \text{DG} \times \text{GX}$$

$$\begin{aligned} \text{Area of Triangle DGE} &= \frac{1}{2} \times \text{DG} \times \text{DE} \\ &= \frac{1}{2} \times \text{DG} \times (2 \times \text{GX}) = \text{DG} \times \text{GX} \end{aligned}$$

$$\begin{aligned} \text{Area of Triangle DGX} : \text{Area of Triangle DGE} \\ &= 1 : 2 \end{aligned}$$

Solution 9

2

$$\begin{aligned} \text{Area of Triangle ACE} &= \frac{1}{2} \times \text{CD} \times \text{AE} \\ &= \frac{1}{2} \times \text{CD} \times \left(\frac{2}{6} \times \text{AD} \right) = \frac{1}{6} \times \text{CD} \times \text{AD} \\ &= \frac{1}{6} \times \text{Area of ABCD} \end{aligned}$$

Solution 10

1

For Triangle BCF, the height is AB and the base is BC.

$$\begin{aligned} \text{Area of Triangle BCF} &= \frac{1}{2} \times \text{AB} \times \text{BC} \\ &= \frac{1}{2} \times \text{Area of Rectangle ABCD} \end{aligned}$$

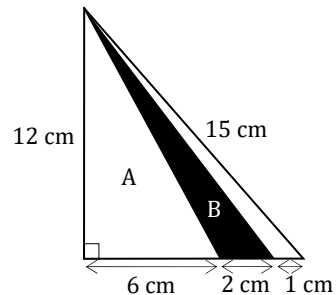
Solution 11

2

$$\begin{aligned} \text{Shaded area of Figure A} \\ &= \text{Shaded area of Figure C} \\ &= \frac{1}{2} \times \text{Length of rectangle} \\ &\quad \times \text{Breadth of rectangle} \end{aligned}$$

Solution 12

1



$$\begin{aligned} \text{Area of Region A and B} &= \frac{1}{2} \times (6 + 2) \times 12 \\ &= 48 \text{ cm}^2 \end{aligned}$$

$$\text{Area of Region A} = \frac{1}{2} \times 6 \times 12 = 36 \text{ cm}^2$$

$$\text{Area of shaded region} = 48 - 36 = 12 \text{ cm}^2$$



Solution 13

2

$$\text{Area of Rectangle ABCD} = 8 \times 6 = 48 \text{ cm}^2$$

$$\text{Area of Triangle ABD} = \frac{1}{2} \times 8 \times 6 = 24 \text{ cm}^2$$

$$\text{Area of Triangle BDE} = \frac{1}{2} \times 10 \times 2 = 10 \text{ cm}^2$$

$$\begin{aligned} \text{Area of shaded region} &= 48 - 24 - 10 \\ &= 14 \text{ cm}^2 \end{aligned}$$

Solution 14

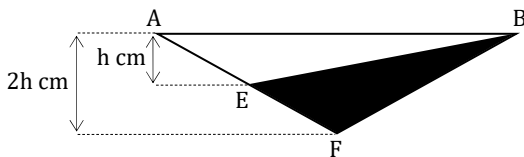
4

$$\begin{aligned} \text{Area of Triangle ACF} &= \frac{1}{2} \times FC \times BC \\ &= \frac{1}{2} \times \text{Area of Rectangle EFCB} \end{aligned}$$

Solution 15

4

Considering Triangle ABF only,

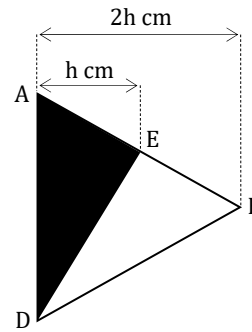


$$\text{Area of Triangle ABF} = \frac{1}{2} \times AB \times 2h$$

$$\text{Area of Triangle ABE} = \frac{1}{2} \times AB \times h$$

$$\begin{aligned} \text{Area of Triangle EBF} \\ &= \text{Area of Triangle ABE} \end{aligned}$$

Considering Triangle ADF only,



$$\text{Area of Triangle ADF} = \frac{1}{2} \times AD \times 2h$$

$$\text{Area of Triangle ADE} = \frac{1}{2} \times AD \times h$$

$$\begin{aligned} \text{Area of Triangle ADE} \\ &= \text{Area of Triangle DEF} \end{aligned}$$

$$\begin{aligned} \text{Area of shaded part} \\ &= \frac{1}{2} \times \text{Area of Triangle ABD} \end{aligned}$$

$$\text{Area of Rectangle ABCD} = 4 \times 120 = 480 \text{ cm}^2$$

Solution 16

$$\text{Total area of figure} = 8 \text{ units}^2$$

$$\text{Area of shaded region} = \frac{1}{2} \times 3 \times 2 = 3 \text{ units}^2$$

$$\text{Fraction of figure which is shaded} = \frac{3}{8}$$

$$\text{Ans: } \frac{3}{8}$$

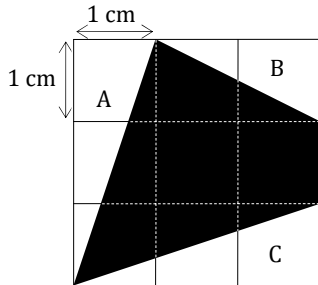


Solution 17

$$\text{Area of shaded triangle} = \frac{1}{2} \times 8 \times 4 = 16 \text{ cm}^2$$

Ans: 16 cm^2

Solution 18



Area of the whole figure = 9 cm^2

$$\text{Area of Triangle A} = \frac{1}{2} \times 3 \times 1 = 1.5 \text{ cm}^2$$

$$\text{Area of Triangle B} = \frac{1}{2} \times 2 \times 1 = 1 \text{ cm}^2$$

$$\text{Area of Triangle C} = \frac{1}{2} \times 3 \times 1 = 1.5 \text{ cm}^2$$

$$\text{Area of the shaded region} = 9 - 1.5 - 1 - 1.5 = 5 \text{ cm}^2$$

Ans: 5 cm^2

Solution 19

For Triangle BCF, the height is AF and the base is BC.

Ans: AF

Solution 20

$$\text{Length of a side of the square} = 128 \div 4 = 32 \text{ cm}$$

$$\text{Area of Triangle WYZ} = \frac{1}{2} \times 32 \times 32 = 512 \text{ cm}^2$$

Ans: 512 cm^2

Solution 21

$$\text{Length of CD} = \frac{1}{2} \times 20 = 10 \text{ cm}$$

$$\text{Area of Triangle ACD} = \frac{1}{2} \times 10 \times 15 = 75 \text{ cm}^2$$

Ans: 75 cm^2

Solution 22

$$\begin{aligned} \text{Area of shaded part} &= \frac{1}{2} \times AB \times BM \\ &= \frac{1}{2} \times AB \times \left(\frac{1}{2} \times BC \right) = \frac{1}{4} \times AB \times BC \\ &= \frac{1}{4} \times \text{Area of Rectangle ABCD} \end{aligned}$$

$$\begin{aligned} \text{Fraction of rectangle which is unshaded} \\ &= 1 - \frac{1}{4} = \frac{3}{4} \end{aligned}$$

Area of shaded part : Area of unshaded part = 1 : 3

Ans: 1 : 3

Solution 23

$$\text{Length of DE} = \frac{2}{3} \times 42 = 28 \text{ cm}$$

$$\text{Area of Triangle DBE} = \frac{1}{2} \times 28 \times 17 = 238 \text{ cm}^2$$

Ans: 238 cm^2

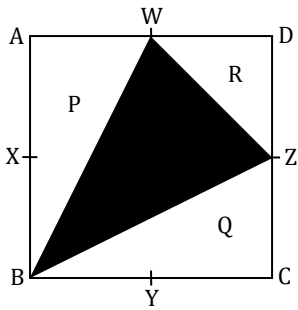
Solution 24

Length of BC and DC = $34 \div 2 = 17$ cm

Length of EC = $17 - 8 - 6 = 3$ cm

Area of the shaded part = $\frac{1}{2} \times 8 \times 3 = 12$ cm²

Ans: 12 cm²

Solution 25

Length of a side of the square = $\sqrt{64} = 8$ cm

Area of Triangle P = $\frac{1}{2} \times 8 \times 4 = 16$ cm²

Area of Triangle Q = $\frac{1}{2} \times 8 \times 4 = 16$ cm²

Area of Triangle R = $\frac{1}{2} \times 4 \times 4 = 8$ cm²

Area of the shaded triangle = $64 - 16 - 16 - 8 = 24$ cm²

Ans: 24 cm²

Solution 26

Area of Square KLMN = $5 \times 5 = 25$ cm²

Area of Triangle NRP = $\frac{1}{2} \times 13 \times 13 = 84.5$ cm²

Area of Triangle LMR = $\frac{1}{2} \times 5 \times (13 - 5)$
= 20 cm²

Total area of the shaded parts
= $25 + 84.5 + 20 = 129.5$ cm²

Ans: 129.5 cm²

Solution 27

Area of a triangle = $\frac{1}{2} \times 11 \times 14 = 77$ cm²

Area of the whole figure = $(2 \times 77) - 32 = 122$ cm²

Note: The overlapped area has to be deducted from the total area of two triangles to avoid double-counting the overlapped area.

Ans: 122 cm²

Solution 28

Length of the base = $10 + 7 + 7 = 24$ cm

Area of the shaded triangle = $\frac{1}{2} \times 24 \times 24 = 288$ cm²

Ans: 288 cm²



Solution 29

$$\text{Area of Triangle ACE} = \frac{1}{2} \times \text{AE} \times \text{CE}$$

$$75 = \frac{1}{2} \times 15 \times \text{CE}$$

$$\text{CE} = \frac{75 \times 2}{15} = 10 \text{ cm}$$

$$\begin{aligned} \text{Length of a side of Square BDEF} &= \sqrt{36} \\ &= 6 \text{ cm} \end{aligned}$$

$$\text{Length of CD} = 10 - 6 = 4 \text{ cm}$$

$$\text{Shaded area} = \frac{1}{2} \times 4 \times 6 = 12 \text{ cm}^2$$

Ans: 12 cm²

Solution 30

$$\text{Area of Triangle BEC} = \frac{1}{2} \times 20 \times 20 = 200 \text{ cm}^2$$

$$\text{Area of Triangle BFC} = \frac{1}{2} \times 20 \times 6 = 60 \text{ cm}^2$$

$$\text{Shaded area} = 200 - 60 = 140 \text{ cm}^2$$

Ans: 140 cm²

Solution 31

$$\text{Length of CD} = \frac{1}{3} \times 36 = 12 \text{ cm}$$

$$\text{AD} = \text{CD} = 12 \text{ cm}$$

$$\text{Area of Triangle ACE} = \frac{1}{2} \times 36 \times 12 = 216 \text{ cm}^2$$

Ans: 216 cm²

Solution 32

For Triangle EFG, the height is AE and the base is EG.

$$\text{Area of Rectangle ABGE} = 2 \times 30 = 60 \text{ cm}^2$$

Since AE is $\frac{1}{2}$ of AD,

$$\text{Area of Rectangle ABCD} = 2 \times 60 = 120 \text{ cm}^2$$

$$\text{Length of AD} = 120 \div 15 = 8 \text{ cm}$$

Ans: 8 cm

Solution 33

Triangle ABC and Triangle ABD have the same base AB. The height of Triangle ABC is twice the height of Triangle ABD.

$$\text{Area of Triangle ABD} = 36 \div 2 = 18 \text{ cm}^2$$

Ans: 18 cm²

Solution 34

$$\text{Area of Triangle CDF} = \frac{1}{2} \times \text{CD} \times \text{GD}$$

$$24 = \frac{1}{2} \times \text{CD} \times \text{GD}$$

$$\text{CD} \times \text{GD} = 2 \times 24 = 48 \text{ cm}^2$$

Since AG = GD,

$$\text{Area of Rectangle ABCD} = 2 \times 48 = 96 \text{ cm}^2$$

Ans: 96 cm²



Solution 35

$$\text{Area of Triangle STR} = \frac{1}{2} \times 13 \times 12 = 78 \text{ cm}^2$$

$$\text{Height of Triangle WSU} = 12 \div 2 = 6 \text{ cm}$$

$$\text{Length of SU} = 13 \div 2 = 6.5 \text{ cm}$$

$$\text{Area of Triangle WSU} = \frac{1}{2} \times 6 \times 6.5 = 19.5 \text{ cm}^2$$

$$\begin{aligned} \text{Area of shaded region} &= 78 - (2 \times 19.5) \\ &= 39 \text{ cm}^2 \end{aligned}$$

$$\text{Ans: } 39 \text{ cm}^2$$

Solution 36

$$\begin{aligned} \text{Area of Triangle CBD} &= \text{Area of Triangle BDE} \\ &= 96 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of Triangle ADF} &= \frac{1}{2} \times 20 \times (2 \times 14) \\ &= 280 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Total area of the figure ABCDEF} \\ &= 96 + 280 = 376 \text{ cm}^2 \end{aligned}$$

$$\text{Ans: } 376 \text{ cm}^2$$

Solution 37

$$\begin{aligned} \text{Area of Triangle VXZ} &= \text{Area of Triangle VUZ} \\ &= \frac{1}{2} \times 12 \times 9 = 54 \text{ cm}^2 \end{aligned}$$

$$\text{Area of Triangle VXZ} = \frac{1}{2} \times \text{VZ} \times \text{YZ}$$

$$54 = \frac{1}{2} \times 15 \times \text{YZ}$$

$$\text{YZ} = \frac{2 \times 54}{15} = 7.2 \text{ cm}$$

$$\text{Ans: } 7.2 \text{ cm}$$

Solution 38

$$\begin{aligned} \text{Base of Triangle A} &= \text{Base of Triangle C} \\ &= \text{Length of rectangle} \end{aligned}$$

$$\begin{aligned} \text{Height of Triangle A} + \text{Height of Triangle C} \\ &= \text{Breadth of rectangle} \end{aligned}$$

$$\begin{aligned} \frac{1}{2} \times \text{Area of rectangle} \\ &= \text{Area of Triangle A} + \text{Area of Triangle C} \\ &= 300 + 100 = 400 \text{ cm}^2 \end{aligned}$$

$$\text{Area of Triangle D} = 400 - 225 = 175 \text{ cm}^2$$

$$\text{Ans: } 175 \text{ cm}^2$$

Solution 39

$$\text{Area of Triangle CDE} = \frac{1}{2} \times 560 = 280 \text{ cm}^2$$

$$\begin{aligned} \text{Area of shaded triangle} &= 280 - 160 \\ &= 120 \text{ cm}^2 \end{aligned}$$

$$\text{Ans: } 120 \text{ cm}^2$$

Solution 40

$$\text{Area of Triangle ABH} = \frac{1}{2} \times 8 \times 8 = 32 \text{ cm}^2$$

$$\text{Length of HF} = 8 + 10 - 4 = 14 \text{ cm}$$

$$\text{Length of DE} = 8 - 1 = 7 \text{ cm}$$

$$\text{Area of Triangle HDF} = \frac{1}{2} \times 14 \times 7 = 49 \text{ cm}^2$$

$$\text{Total area of shaded parts} = 32 + 49 = 81 \text{ cm}^2$$

$$\text{Ans: } 81 \text{ cm}^2$$



Solution 41

$$\text{Area of Rectangle CDEG} = 2 \times 32 = 64 \text{ cm}^2$$

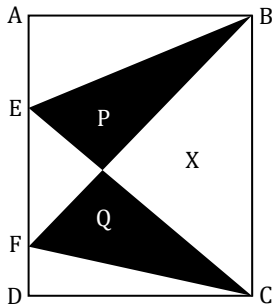
Since Rectangle ABGE and Rectangle CDEG have the same length, and AD is thrice of AE,

$$\text{Area of Rectangle ABGE} = 64 \div 2 = 32 \text{ cm}^2$$

$$\text{Area of Triangle EHG} = 32 \div 2 = 16 \text{ cm}^2$$

$$\text{Shaded area} = 64 - 32 + 16 = 48 \text{ cm}^2$$

Ans: 48 cm^2

Solution 42

$$\begin{aligned} &\text{Area of Part P} + \text{Area of Part X} \\ &= \text{Area of Triangle BEC} \\ &= \frac{1}{2} \times 600 = 300 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} &\text{Area of Part Q} + \text{Area of Part X} \\ &= \text{Area of Triangle BFC} \\ &= \frac{1}{2} \times 600 = 300 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} &\text{Area of Part P} + \text{Area of Part X} \\ &+ \text{Area of Part Q} + \text{Area of Part X} \\ &= 300 + 300 = 600 \text{ cm}^2 \end{aligned}$$

$$2 \times \text{Area of Part X} = 600 - 150 = 450 \text{ cm}^2$$

$$\text{Area of Part X} = 450 \div 2 = 225 \text{ cm}^2$$

Ans: 225 cm^2

Solution 43

True:

The line QS can be the height of both Triangle QRS and Triangle PQS.

Reason:

If the height of Triangle QRS is QS, the base is SR.

If the height of Triangle PQS is QS, the base is PS.

False:

If the base of Triangle PQR is PR, the height is PQ.

Reason:

If the base of Triangle PQR is PR, the height is QS.

Solution 44

(a) AC

(b) CF

Solution 45

False: The area of Triangle ABC is 90 cm^2 .

Reason:

$$\text{Area of Triangle ABC} = \frac{1}{2} \times 12 \times 9 = 54 \text{ cm}^2$$

False:

When the height and base of Triangle ABC is doubled, the area of the new triangle is also doubled.

Reason:

$$\begin{aligned} \text{Area of new triangle} &= \frac{1}{2} \times (2 \times 12) \times (2 \times 9) \\ &= 216 \text{ cm}^2 \end{aligned}$$

$$\frac{216}{54} = 4$$

The area of the new triangle is four times the area of Triangle ABC.



Solution 46

$$\begin{aligned} \text{(a) Area of Triangle ABE} &= \frac{1}{2} \times \text{AE} \times \text{BD} \\ &= \frac{1}{2} \times \text{ED} \times \text{BD} = \text{Area of Triangle BED} \\ &= 16 \text{ cm}^2 \end{aligned}$$

Ans: 16 cm^2

$$\begin{aligned} \text{(b) Area of Triangle EBC} &= \frac{1}{2} \times \text{ED} \times \text{BC} \\ &= \frac{1}{2} \times \text{ED} \times \left(\frac{1}{2} \times \text{BD} \right) = \frac{1}{2} \times \frac{1}{2} \times \text{BD} \times \text{ED} \\ &= \frac{1}{2} \times \text{Area of Triangle BED} = \frac{1}{2} \times 16 = 8 \text{ cm}^2 \end{aligned}$$

Ans: 8 cm^2 **Solution 47**

$$\begin{aligned} \text{Length of rectangle} \\ &= 4 \times \text{Breadth of rectangle} \end{aligned}$$

$$\text{Breadth of rectangle} = 24 \div 8 = 3 \text{ cm}$$

$$\text{Height of Triangle ACY} = 4 \times 3 = 12 \text{ cm}$$

$$\text{Base of Triangle ACY} = 2 \times 3 = 6 \text{ cm}$$

$$\text{Area of Triangle ACY} = \frac{1}{2} \times 12 \times 6 = 36 \text{ cm}^2$$

Ans: 36 cm^2 **Solution 48**

$$\begin{aligned} \text{Area of Rectangle ABCD} &= (11 + 9) \times 8 \\ &= 160 \text{ cm}^2 \end{aligned}$$

$$\text{Area of Triangle PQC} = \frac{1}{2} \times 9 \times 12 = 54 \text{ cm}^2$$

$$\text{Length of PB} = 12 - 8 = 4 \text{ cm}$$

$$\text{Length of SB} = 11 + 9 - 17 = 3 \text{ cm}$$

$$\text{Area of Triangle PBS} = \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}^2$$

$$\begin{aligned} \text{Area of Figure ASPQD} &= 160 + 54 + 6 \\ &= 220 \text{ cm}^2 \end{aligned}$$

Ans: 220 cm^2 **Solution 49**

$$\text{Area of shaded part} = \frac{1}{8} \times 12 \times 12 = 18 \text{ cm}^2$$

$$\text{Area of Triangle EFG} = \frac{1}{2} \times 35 \times 20 = 350 \text{ cm}^2$$

$$\begin{aligned} \text{Unshaded area of Triangle EFG} &= 350 - 18 \\ &= 332 \text{ cm}^2 \end{aligned}$$

Ans: 332 cm^2 **Solution 50**

$$\text{(a) Area of Triangle ABH} = \frac{1}{2} \times \text{AB} \times \text{BH}$$

$$72 = \frac{1}{2} \times \text{AB} \times \text{BH}$$

$$\text{AB} \times \text{BH} = 2 \times 72 = 144$$

$$\text{AB} = \text{BH} = \sqrt{144} = 12 \text{ cm}$$

$$\begin{aligned} \text{Length of a side of Square BCDE} &= \sqrt{25} \\ &= 5 \text{ cm} \end{aligned}$$

$$\text{Area of Triangle BHE} = \frac{1}{2} \times 12 \times 5 = 30 \text{ cm}^2$$

Ans: 30 cm^2 

(b) Length of a side of Square EFGH = $\sqrt{169}$
 = 13 cm

Perimeter of the shaded area
 = $(3 \times 13) + (3 \times 5) + 12 = 66$ cm

Ans: 66 cm

Solution 51

Length of EC = $\frac{1}{3} \times 78 = 26$ cm

Area of Triangle ACE = $\frac{1}{2} \times 26 \times 40 = 520$ cm²

Area of Triangle BCE = $\frac{1}{2} \times 26 \times 40 = 520$ cm²

Area of Triangle BCF = $520 - 130 = 390$ cm²

Total area of shaded region = $520 + 390 = 910$ cm²

Ans: 910 cm²

Solution 52

(a) Length of AD = $42 \div 2 = 21$ cm

Ans: 21 cm

(b) Length of AP = $\frac{3}{7} \times 21 = 9$ cm

Length of PD = $21 - 9 = 12$ cm

Total area of Triangle APQ and Triangle BSR
 = $2 \times \frac{1}{2} \times 9 \times 9 = 81$ cm²

Total area of Triangle PDT and Triangle SCT
 = $\frac{1}{2} \times 42 \times 12 = 252$ cm²

Area of Rectangle ABCD = $42 \times 21 = 882$ cm²

Area of the shaded region = $882 - 81 - 252 = 549$ cm²

Ans: 549 cm²

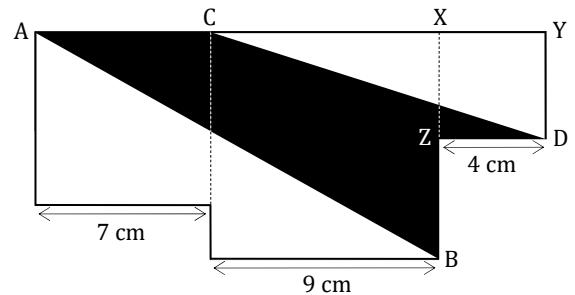
Solution 53

Length of triangle = $7 + 4 = 11$ cm

Area of Figure 2 = $4 \times \left(\frac{1}{2} \times 11 \times 4 \right) + (7 \times 7)$
 = 137 cm²

Ans: 137 cm²

Solution 54



Area of Triangle ABX = $\frac{1}{2} \times 9 \times (9 + 7)$
 = 72 cm²

Area of Square XYDZ = $4 \times 4 = 16$ cm²

Area of Triangle CYD = $\frac{1}{2} \times 4 \times (9 + 4)$
 = 26 cm²

Shaded area = $72 + 16 - 26 = 62$ cm²

Ans: 62 cm²

