

AREA

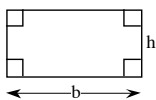
#3

AREA is the number of square units in a flat region. The formulas to calculate the area of several kinds of polygons are:

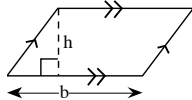
RECTANGLE PARALLELOGRAM

TRAPEZOID

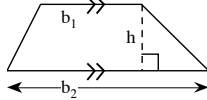
TRIANGLE



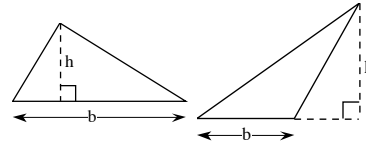
$$A = bh$$



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$$A = \frac{1}{2}(b_1 + b_2)h$$



$$A = \frac{1}{2}bh$$

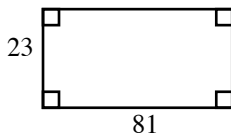
Note that the legs of any right triangle form a base and a height for the triangle.

The area of a more complicated figure may be found by breaking it into smaller regions of the types shown above, calculating each area, and finding the sum.

Example 1

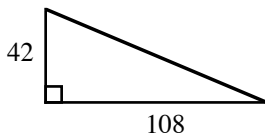
Find the area of each figure. All lengths are centimeters.

a)



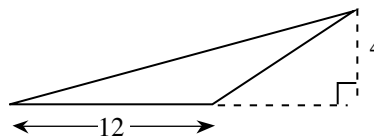
$$A = bh = (81)(23) = 1863 \text{ cm}^2$$

c)



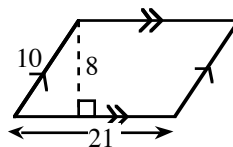
$$A = \frac{1}{2}(108)(42) = 2268 \text{ cm}^2$$

b)



$$A = \frac{1}{2}(12)(4) = 24 \text{ cm}^2$$

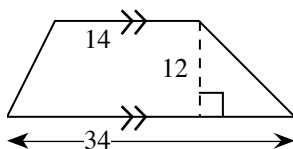
d)



$$A = (21)8 = 168 \text{ cm}^2$$

Note that 10 is a side of the parallelogram, not the height.

e)



$$A = \frac{1}{2}(14 + 34)12 = \frac{1}{2}(48)(12) = 288 \text{ cm}^2$$

Example 2

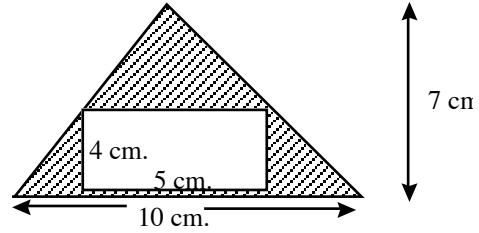
Find the area of the shaded region.

The area of the shaded region is the area of the triangle minus the area of the rectangle.

triangle: $A = \frac{1}{2}(7)(10) = 35 \text{ cm}^2$

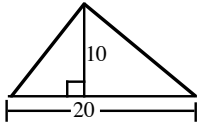
rectangle: $A = 5(4) = 20 \text{ cm}^2$

shaded region: $A = 35 - 20 = 15 \text{ cm}^2$

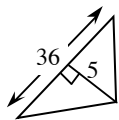


Find the area of the following triangles, parallelograms and trapezoids. Pictures are not drawn to scale. Round answers to the nearest tenth.

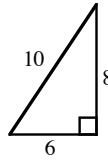
1.



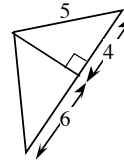
2.



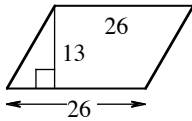
3.



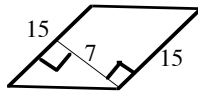
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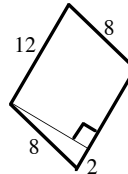
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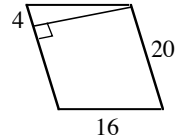
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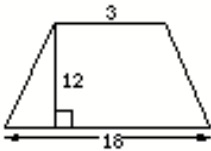
7.



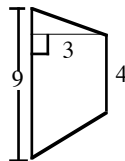
8.



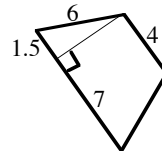
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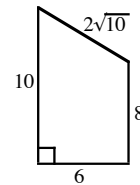
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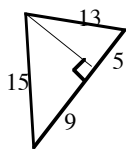
11.



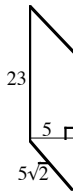
12.



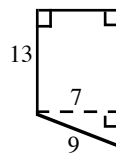
13.



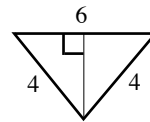
14.



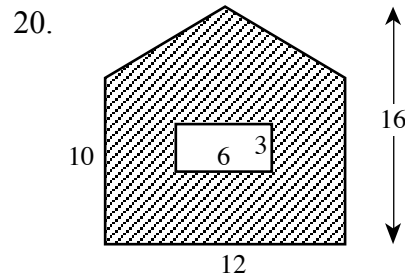
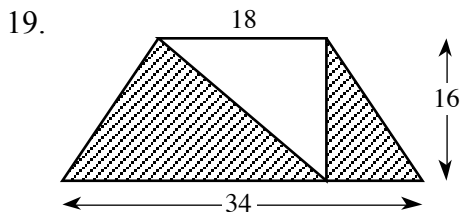
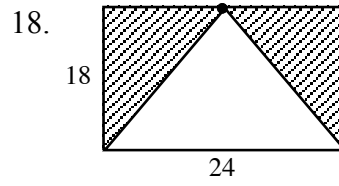
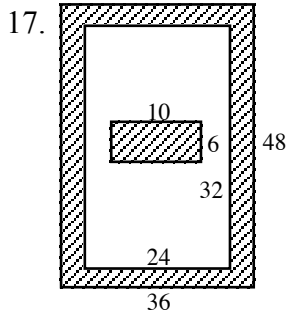
15.



16.



Find the area of the shaded region.



Answers (in square units)

- | | | | | | |
|---------|----------|-----------|----------|----------|---------|
| 1. 100 | 2. 90 | 3. 24 | 4. 15 | 5. 338 | 6. 105 |
| 7. 93 | 8. 309.8 | 9. 126 | 10. 19.5 | 11. 36.3 | 12. 54 |
| 13. 84 | 14. 115 | 15. 110.8 | 16. 7.9 | 17. 1020 | 18. 216 |
| 19. 272 | 20. 138 | | | | |