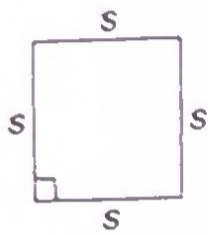


INVESTIGATING MATH

Reviewing Formulas

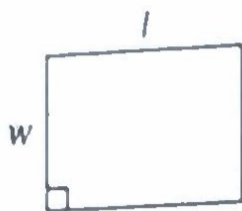
Recall the formulas for the perimeter, P , and the area, A , of the following plane figures.

Square



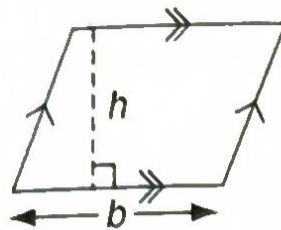
$$P = 4s$$
$$A = s^2$$

Rectangle



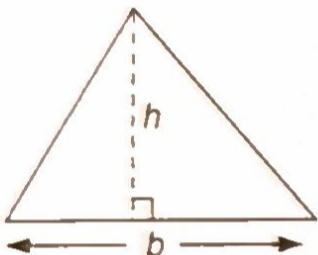
$$P = 2(l + w)$$
$$A = l \times w$$

Parallelogram



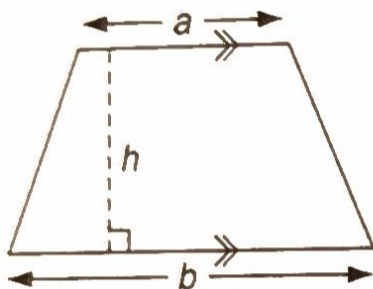
$$P = \text{sum of side lengths}$$
$$A = b \times h$$

Triangle



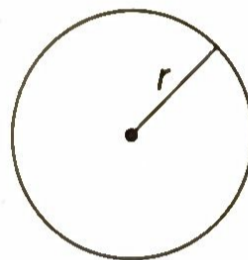
$$P = \text{sum of side lengths}$$
$$A = \frac{1}{2} \times b \times h$$

Trapezoid



$$P = \text{sum of side lengths}$$
$$A = \frac{1}{2} \times (a + b) \times h$$

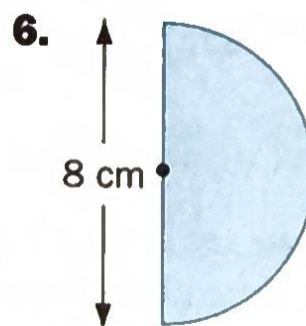
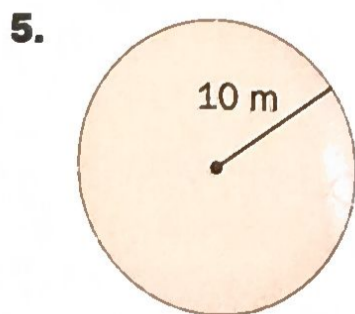
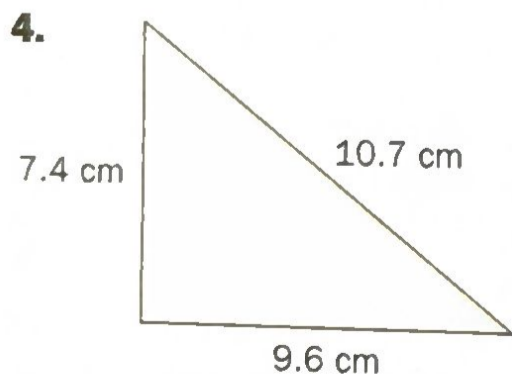
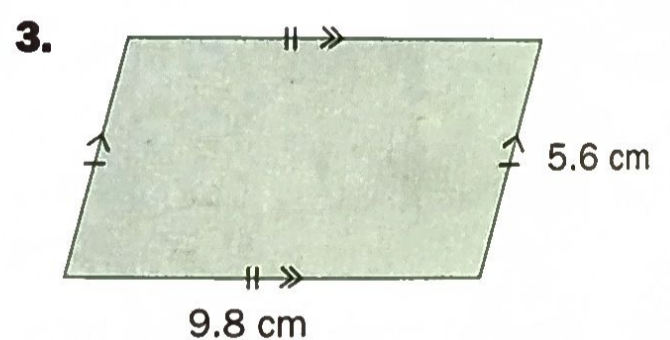
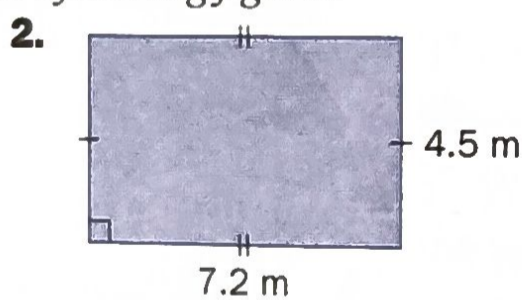
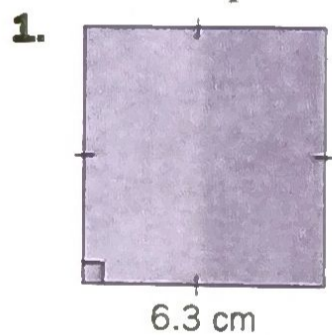
Circle



$$C = \pi \times d \text{ or } 2 \times \pi \times r$$
$$A = \pi \times r^2$$

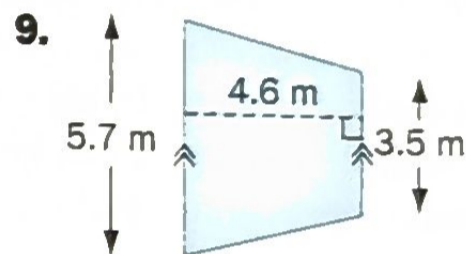
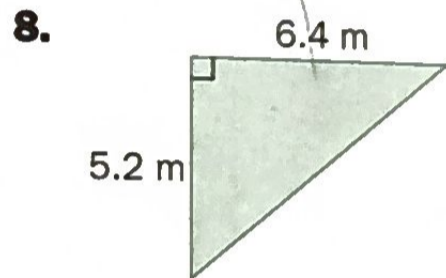
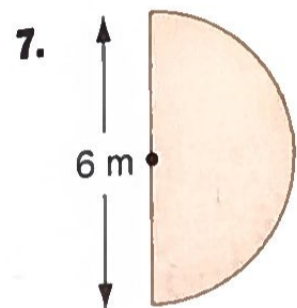
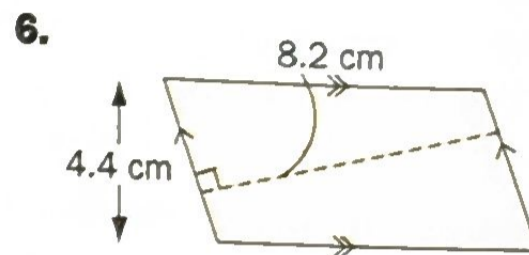
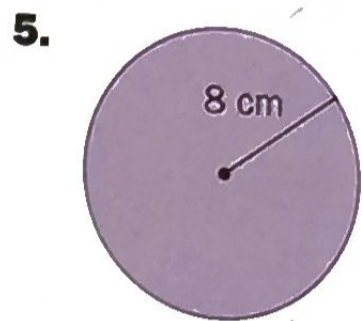
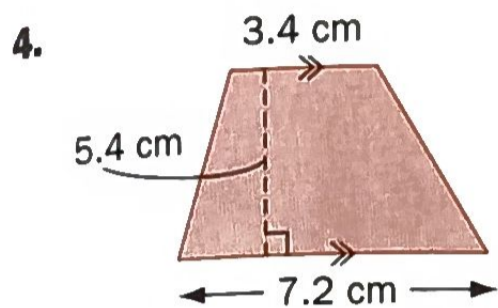
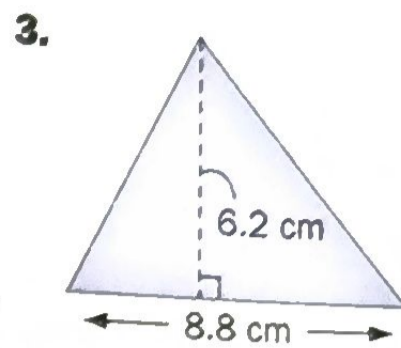
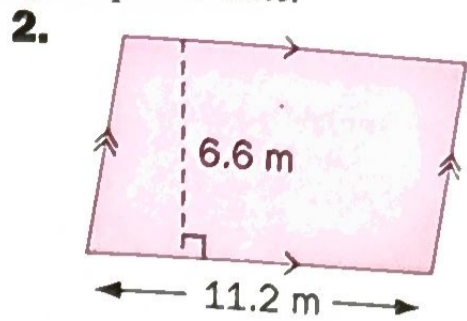
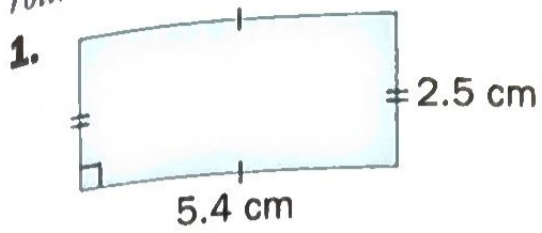
1 Finding the Perimeter

Calculate the perimeter of each of the following figures.



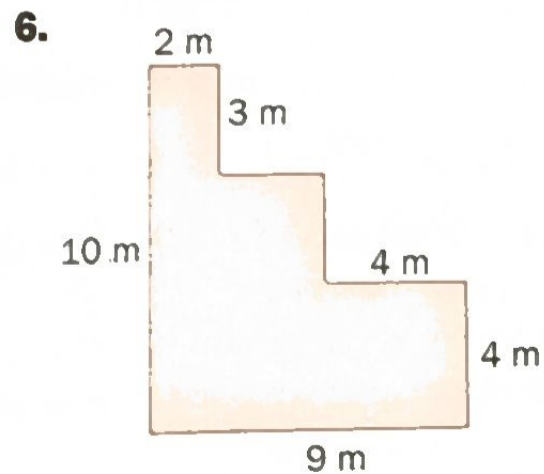
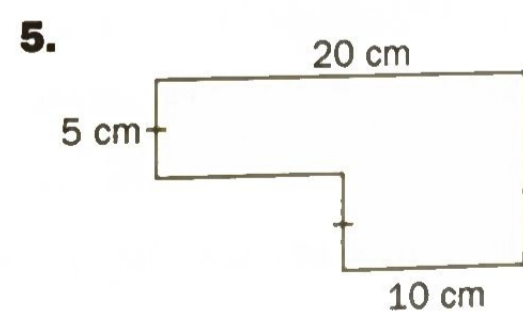
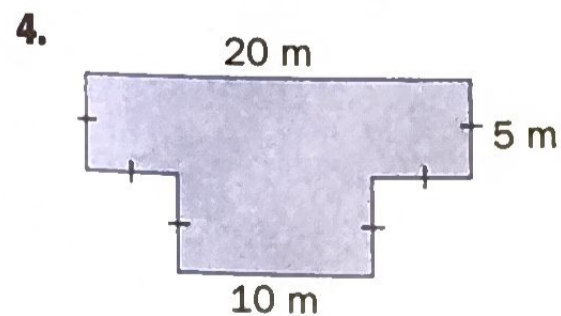
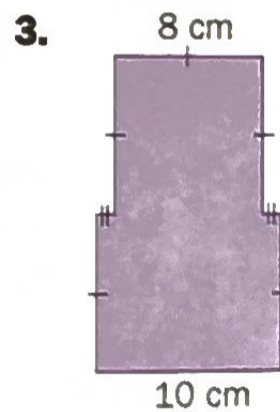
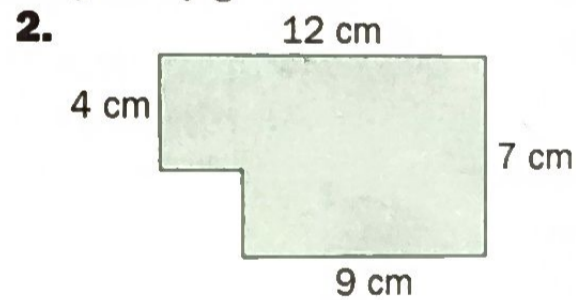
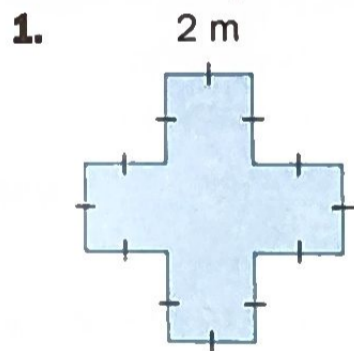
2 Finding the Area

Calculate the area of each of the following figures. If necessary, round answers to the nearest tenth of a square unit.



3 Finding the Perimeter and the Area

Calculate the perimeter and the area of each figure.



Landscaping

Example The diagram shows a house on a lot that is in the shape of a trapezoid. The parallel sides of the trapezoid measure 18 m and 24 m. The height of the trapezoid is 26 m. The dimensions of the house, the path to the front door, and the driveway are shown in the diagram. The remaining area of the lot is to be covered with sod. What is the area that needs to be covered with sod?

Solution Calculate the total area of the house, path, and driveway. Then, subtract this area from the area of the lot.

$$\text{Area of the house: } A_h = 12 \times 10 = 120$$

$$\text{Area of the path: } A_p = 3 \times 1 = 3$$

$$\text{Area of the driveway: } A_d = 5 \times 3 = 15$$

$$\text{Total Area: } 120 + 3 + 15 = 138$$

$$\begin{aligned} \text{Area of the lot: } A_l &= \frac{1}{2} \times (a + b) \times h \\ &= \frac{1}{2} \times (18 + 24) \times 26 \\ &= \frac{1}{2} \times 42 \times 26 \\ &= 21 \times 26 \\ &= 546 \end{aligned}$$

Estimate

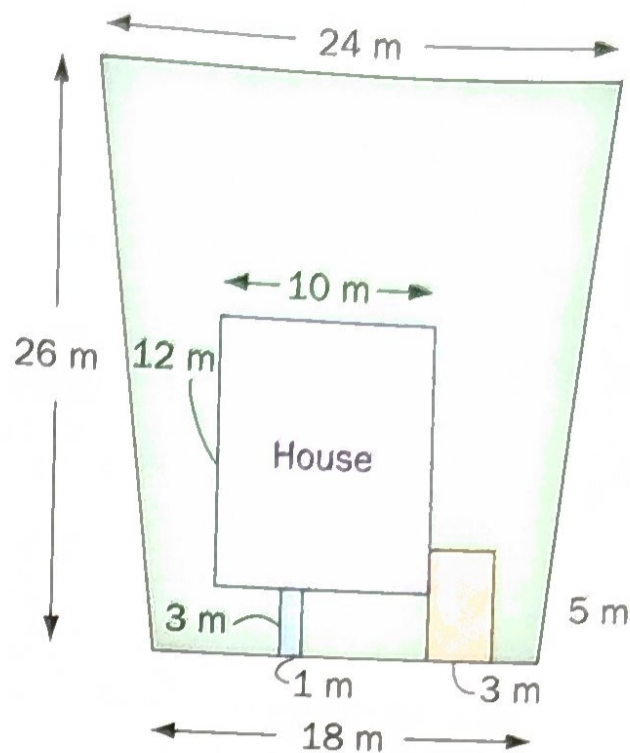
$$20 \times 30 = 600$$

Estimate

$$550 - 150 = 400$$

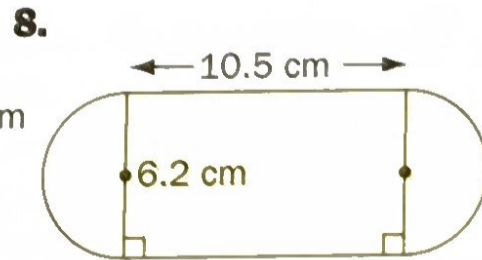
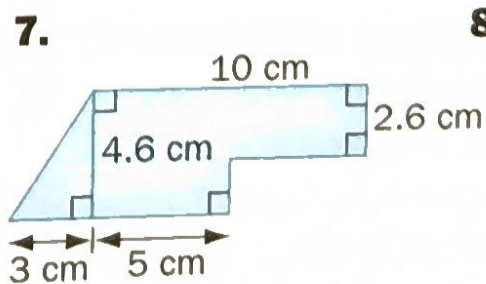
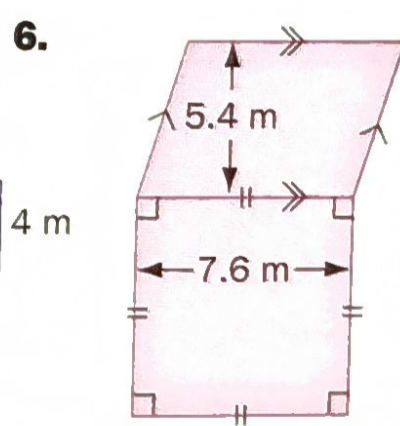
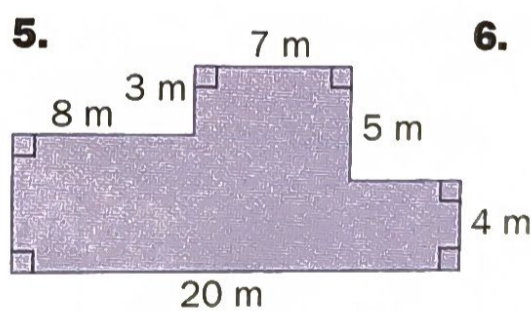
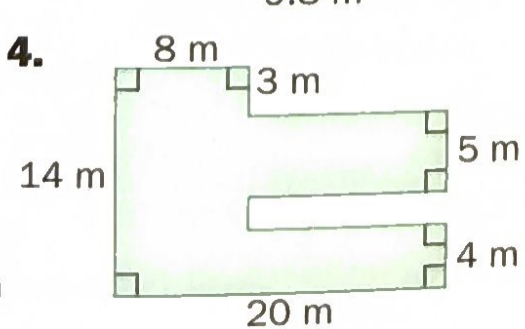
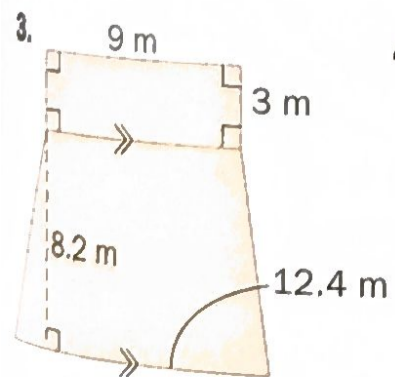
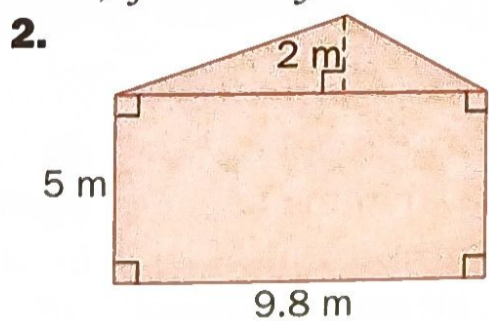
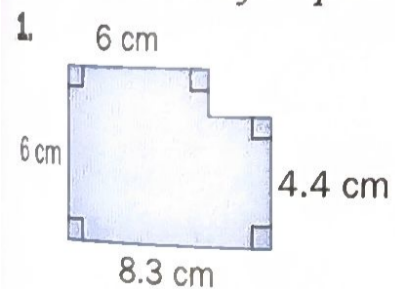
$$\text{Area to be covered with sod: } 546 - 138 = 408$$

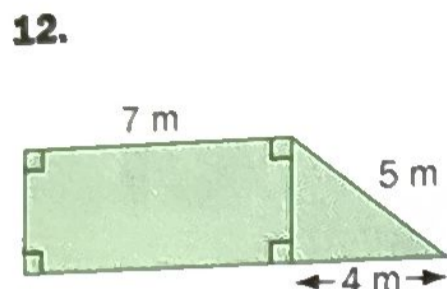
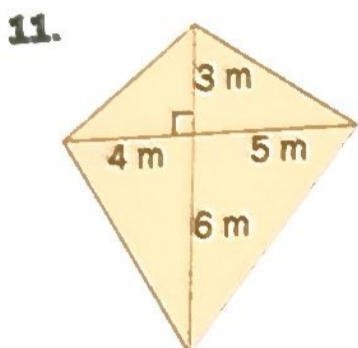
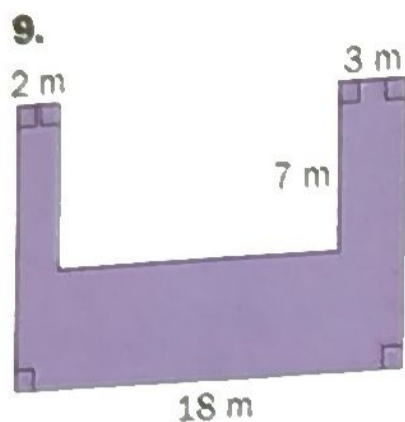
The area of the lot that needs to be covered is 408 m^2 .



Practice

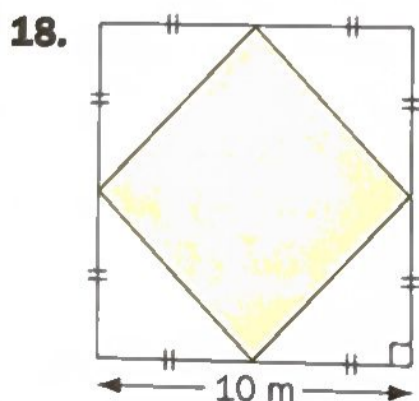
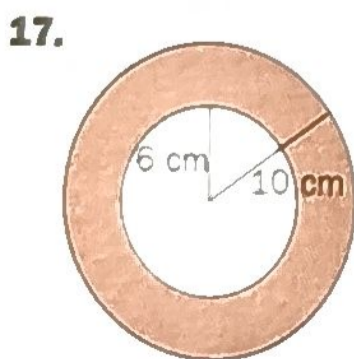
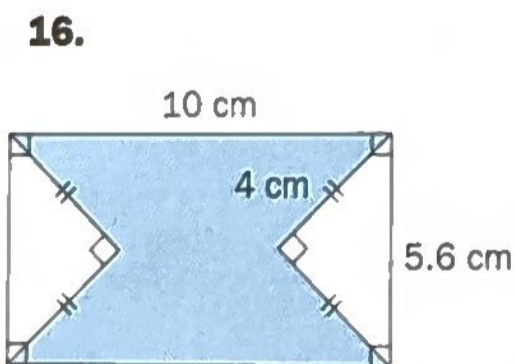
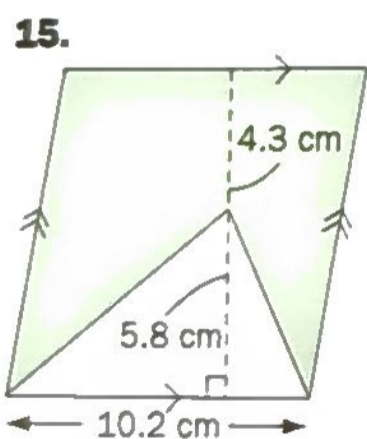
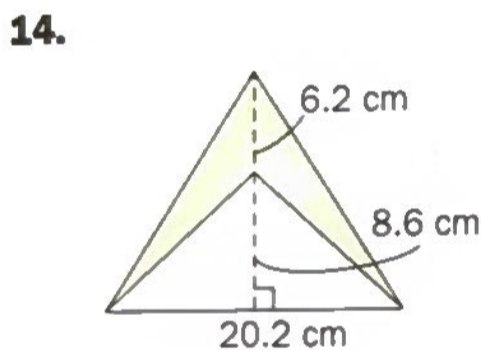
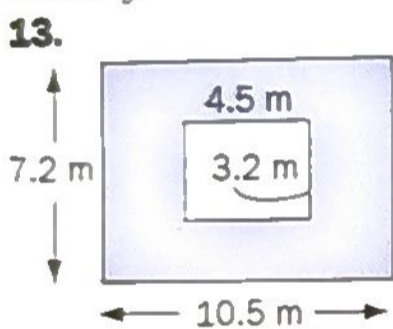
A Calculate the area of each figure. Round answers to the nearest tenth of a square unit, if necessary.



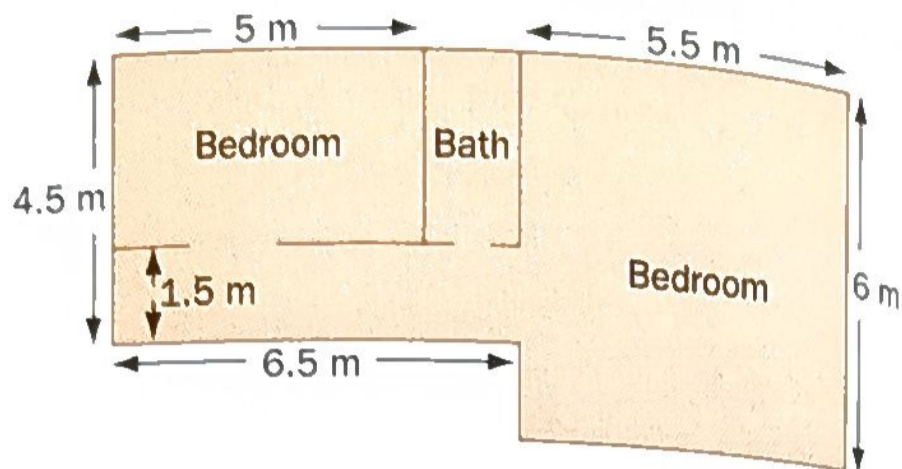


Applications and Problem Solving

Calculate the area of each shaded region. Round answers to the nearest tenth of a square unit, if necessary.

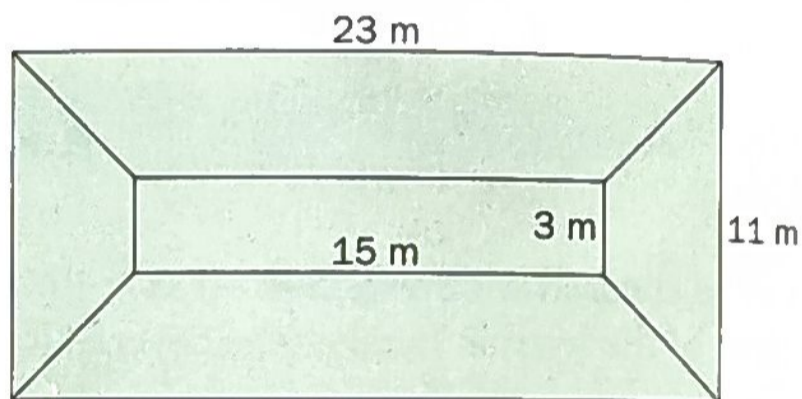


B
19. Carpeting The diagram shows the plan of the second floor of a new house. The hall and the two bedrooms are to be carpeted.



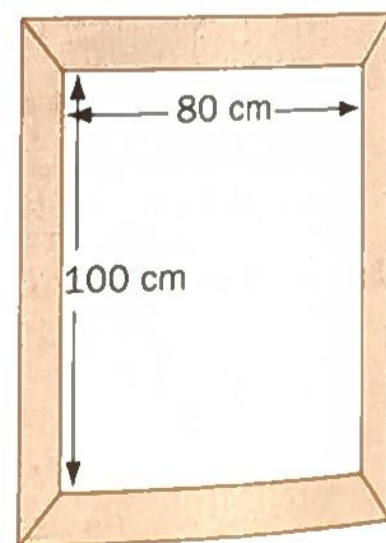
Calculate the area of carpet needed, in square metres.

20. Roofing Sandrine needs to replace the roofing material on her home. The roof has a rectangle on top and sloping trapezoids on each side. The dimensions of the roof are shown. Each trapezoid has a height of 4.5 m.

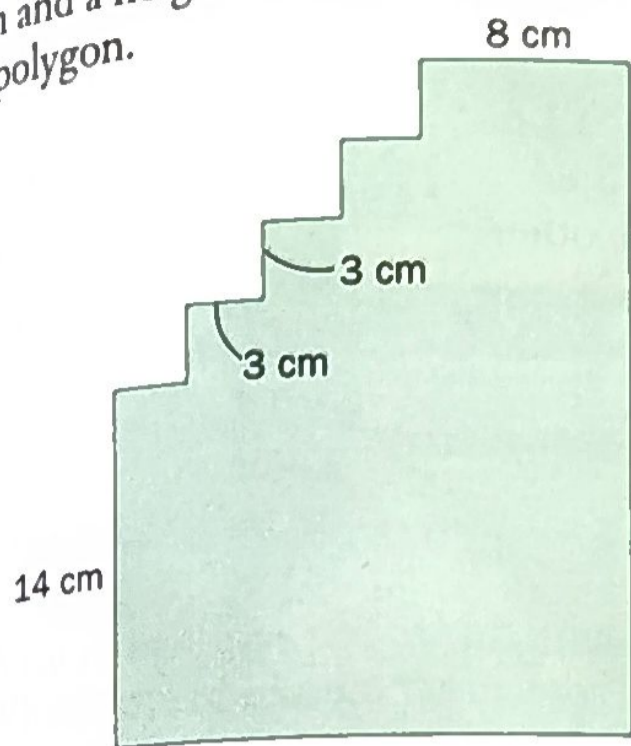


- a) Calculate the area of the roof.
- b) The trapezoids are to be covered with shingles. If a package of shingles covers 10 m^2 , how many packages will be needed?

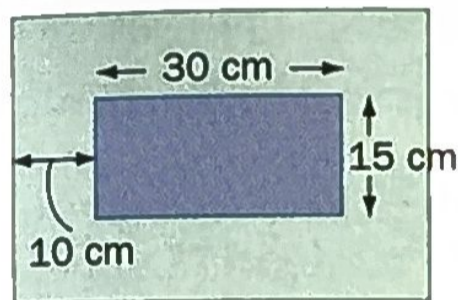
21. Carpentry Lamar works as a carpenter. He is framing a window that measures 100 cm by 80 cm. The frame is made up of four trapezoids. The frame is 10 cm wide. Find the total area of the four trapezoids.



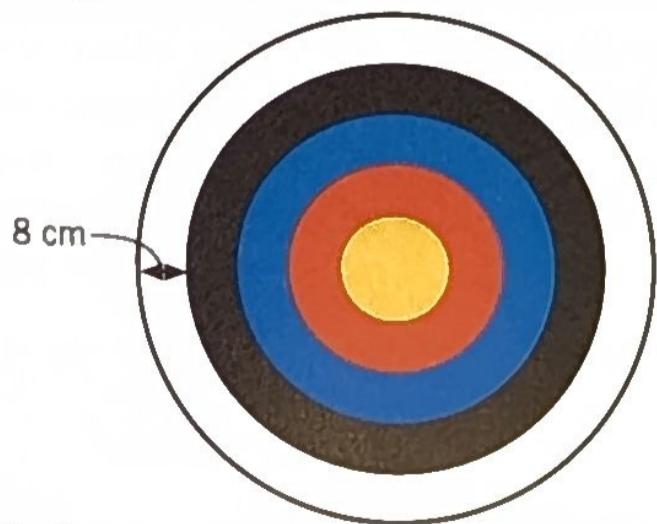
22. Each "step" of the polygon has a width of 3 cm and a height of 3 cm. Calculate the area of the polygon.



23. **Picture framing** The picture measures 30 cm by 15 cm. The mat around the picture is 10 cm wide. Calculate the area of the mat.

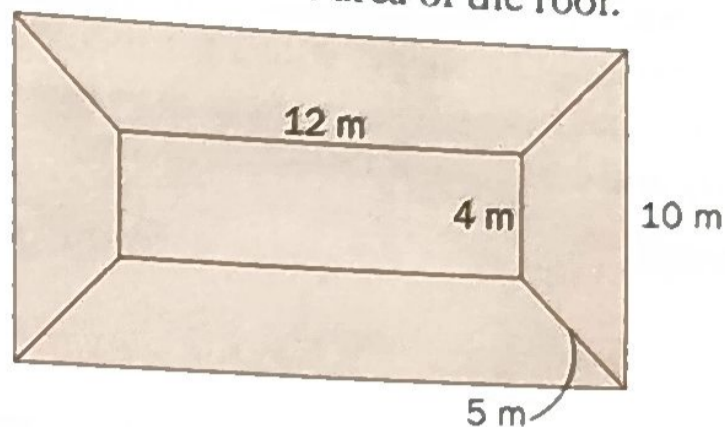


24. **Archery** One of the targets used in archery competitions has a diameter of 80 cm. The circle in the centre is gold and has a radius of 8 cm. The gold circle is surrounded by 4 rings, which are coloured red, blue, black, and white. Each of these 4 rings is 8 cm wide.

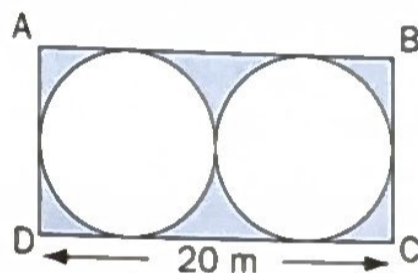


- a) Calculate the area of the blue ring, to the nearest square centimetre.
b) What percent of the target is blue?

- C**
25. **House roof** A diagram of the roof of a house is shown. The top of the roof is a rectangle. The four trapezoids have the same height. Calculate the area of the roof.

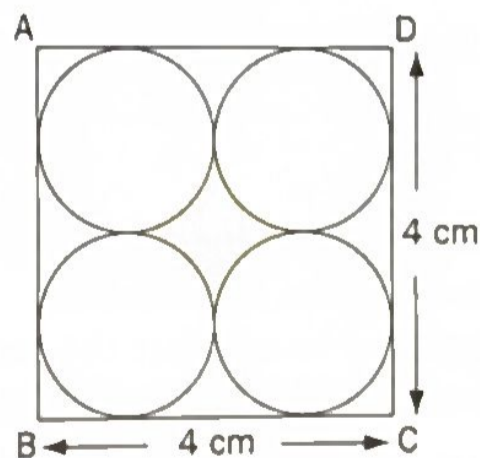


26. The two circles are identical, and figure ABCD is a rectangle.



- a) Determine the total area of the shaded regions. Write your answer in terms of π .
b) Calculate the total area of the shaded regions, to the nearest square metre.

27. The four circles are identical, and figure ABCD is a square.



- a) Determine the area of the shaded region. Write your answer in terms of π .
b) Calculate the area of the shaded region, to the nearest tenth of a square centimetre. Explain how you can judge whether your answer is reasonable.