

Area of Polygons

Answer key

HSG.GPE.B.7

14 problems

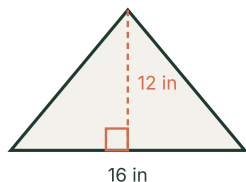
1. Find the area of the parallelogram.



Answer 126 square cm

$A = bh = 18 \times 7 = 126$ square cm. Use the perpendicular height, not the slanted side.

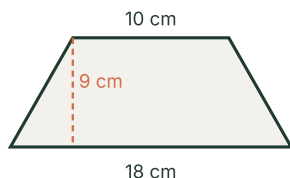
2. Find the area of the triangle.



Answer 96 square in

$A = \frac{1}{2}bh = \frac{1}{2}(16)(12) = 96$ square in.

3. Find the area of the trapezoid using $A = \frac{1}{2}(b_1 + b_2)h$.



Answer 126 square cm

$A = \frac{1}{2}(b_1 + b_2)h = \frac{1}{2}(10 + 18)(9) = \frac{1}{2}(28)(9) = 126$ square cm.

4. A triangle has a base of 24 ft and a height of 9 ft. Find its area.

Answer 108 square ft

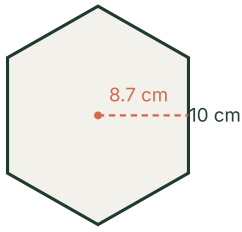
$A = \frac{1}{2}bh = \frac{1}{2}(24)(9) = 108$ square ft.

5. Find the area of a rhombus whose diagonals measure 12 cm and 16 cm. (Use $A = \frac{1}{2}d_1d_2$.)

Answer 96 square cm

$A = \frac{1}{2}d_1d_2 = \frac{1}{2}(12)(16) = 96$ square cm.

6. Find the area of the regular hexagon with the apothem and side length shown.



Answer 261 square cm

Perimeter $P = 6 \times 10 = 60$ cm. $A = \frac{1}{2}aP = \frac{1}{2}(8.7)(60) = 261$ square cm.

7. A regular pentagon has a side length of 8 in and an apothem of 5.5 in. Find its area.

Answer 110 square in

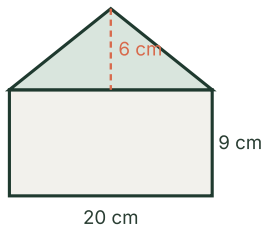
Perimeter $P = 5 \times 8 = 40$ in. $A = \frac{1}{2}aP = \frac{1}{2}(5.5)(40) = 110$ square in.

8. A parallelogram has an area of 84 square m and a base of 12 m. Find its height.

Answer 7 m

$A = bh$, so $84 = 12h$ and $h = 84 \div 12 = 7$ m.

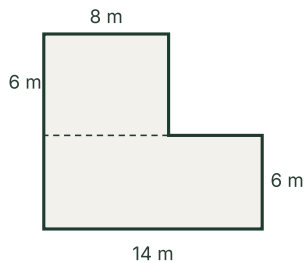
9. Find the total area of the composite figure (a rectangle with a triangle on top).



Answer 240 square cm

Rectangle: $20 \times 9 = 180$. Triangle: $\frac{1}{2}(20)(6) = 60$. Total = $180 + 60 = 240$ square cm.

10. Find the area of the L-shaped figure by splitting it into rectangles.



Answer 132 square m

Top rectangle: $8 \times 6 = 48$. Bottom rectangle: $14 \times 6 = 84$. Total = $48 + 84 = 132$ square m.

11. Which formula gives the area of a regular polygon with apothem a and perimeter P ?

Answer B) $\frac{1}{2}aP$

A regular polygon splits into congruent triangles of height a ; their areas total $\frac{1}{2}aP$.

12. A triangle has an area of 54 square cm and a height of 12 cm. Find the length of its base.

Answer 9 cm

$$A = \frac{1}{2}bh, \text{ so } 54 = \frac{1}{2}b(12) = 6b. \text{ Then } b = 54 \div 6 = 9 \text{ cm.}$$

13. A patio is shaped like a trapezoid with parallel sides of 22 ft and 14 ft and a height of 10 ft. Concrete costs \$6 per square foot. Find the total cost to pour the patio.

Answer \$1080

$$\text{Area} = \frac{1}{2}(22 + 14)(10) = \frac{1}{2}(36)(10) = 180 \text{ square ft. Cost} = 180 \times \$6 = \$1080.$$

14. A regular octagonal tabletop has a side length of 6 in and an apothem of 7.2 in. A finish covers 50 square inches per ounce. How many full ounces are needed to coat the top?

Answer 4 ounces

$$\text{Perimeter} = 8 \times 6 = 48 \text{ in. Area} = \frac{1}{2}(7.2)(48) = 172.8 \text{ square in. } 172.8 \div 50 = 3.456, \text{ so round up to 4 ounces.}$$