# AREAS OF TRIANGLES AND QUADRILATERALS FOR AMC 8: PRACTICE SET

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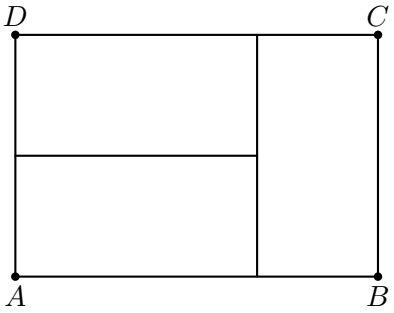
## 1. Problems

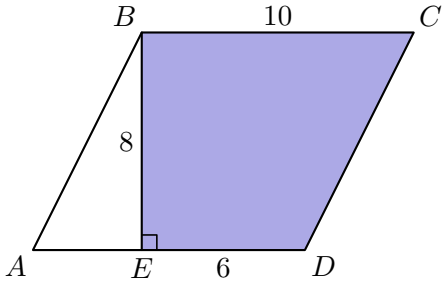
**Beginner.**

**1.** (2019 AMC 8, Problem #2) Three identical rectangles are put together to form rectangle $ABCD$, as shown in the figure below. Given that the length of the shorter side of each of the smaller rectangles is 5 feet, what is the area in square feet of rectangle $ABCD$?



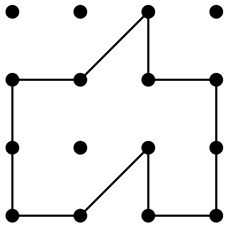

**(A)** 45 **(B)** 75 **(C)** 100 **(D)** 125 **(E)** 150

**2.** (1989 AJHSME, Problem #15) In parallelogram $ABCD$ shown, what is the area of the shaded region $BEDC$?



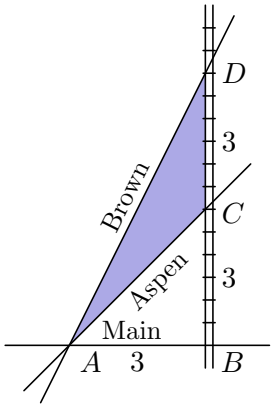

**(A)** 24 **(B)** 48 **(C)** 60 **(D)** 64 **(E)** 80

**3.** (1998 AJHSME, Problem #6) Dots are spaced one unit apart, horizontally and vertically. The number of square units enclosed by the polygon is



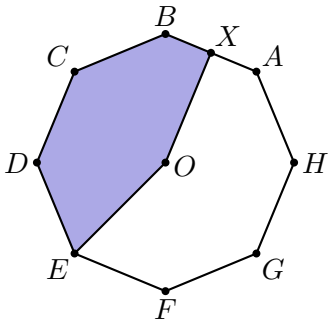
**(A)** 5 **(B)** 6 **(C)** 7 **(D)** 8 **(E)** 9

**4.** (2009 AMC 8, Problem #7) The triangular plot of land $ACD$ lies between Aspen Road, Brown Road and a railroad. Main Street runs east and west, and the railroad runs north and south. The numbers in the diagram indicate distances in miles. The width of the railroad track can be ignored. How many square miles are in the plot of land $ACD$?




**(A)** 2 **(B)** 3 **(C)** 4.5 **(D)** 6 **(E)** 9

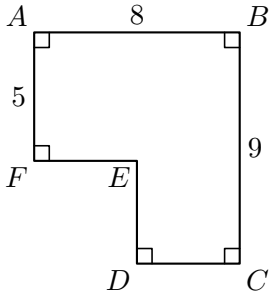
**5.** (2015 AMC 8, Problem #2) Point $O$ is the center of the regular octagon $ABCDEFGH$, and $X$ is the midpoint of the side $\overline{AB}$. What fraction of the area of the octagon is shaded?




**(A)** $\frac{11}{32}$ **(B)** $\frac{3}{8}$ **(C)** $\frac{13}{32}$ **(D)** $\frac{7}{16}$ **(E)** $\frac{15}{32}$

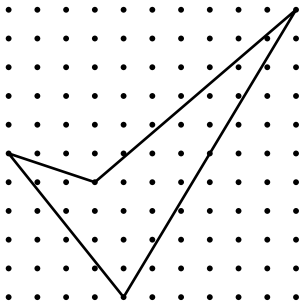
**Intermediate.**

**6.** (2005 AMC 8, Problem #13) The area of polygon $ABCDEF$ is 52 with $AB = 8$, $BC = 9$ and $FA = 5$. What is $DE + EF$?




**(A)** 7 **(B)** 8 **(C)** 9 **(D)** 10 **(E)** 11

**7.** (2004 AMC 8, Problem #14) What is the area enclosed by the geoboard quadrilateral below?



**(A)** 15 **(B)** $18\frac{1}{2}$ **(C)** $22\frac{1}{2}$ **(D)** 27 **(E)** 41

**8.** (1951 AHSME, Problem #3) If the length of a diagonal of a square is $a+b$, then the area of the square is:

**(A)** $(a+b)^2$ **(B)** $\frac{1}{2}(a+b)^2$ **(C)** $a^2+b^2$ **(D)** $\frac{1}{2}(a^2+b^2)$ **(E)** None of these

**9.** (1959 AHSME, Problem #10) In triangle $ABC$, with $\overline{AB}=\overline{AC}=3.6$, a point $D$ is taken on $\overline{AB}$ at a distance 1.2 from $A$. Point $D$ is joined to point $E$ in the prolongation of $\overline{AC}$ so that triangle $AED$ is equal in area to triangle $ABC$. Then $\overline{AE}$ equals:

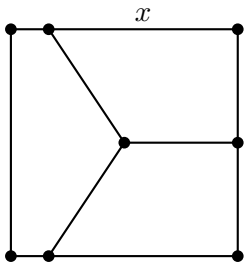
**(A)** 4.8 **(B)** 5.4 **(C)** 7.2 **(D)** 10.8 **(E)** 12.6

**10.** (2022 AMC 8, Problem #18) The midpoints of the four sides of a rectangle are $(-3,0)$, $(2,0)$, $(5,4)$, and $(0,4)$. What is the area of the rectangle?

**(A)** 20 **(B)** 25 **(C)** 40 **(D)** 50 **(E)** 80

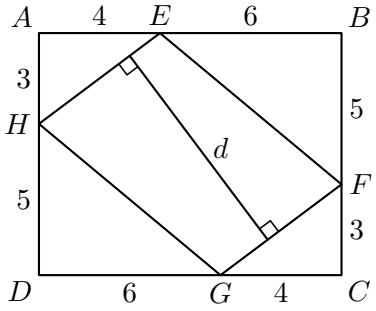
**Advanced.**

**11.** (1998 AHSME, Problem #8) A square with sides of length 1 is divided into two congruent trapezoids and a pentagon, which have equal areas, by joining the center of the square with points on three of the sides, as shown. Find $x$, the length of the longer parallel side of each trapezoid.



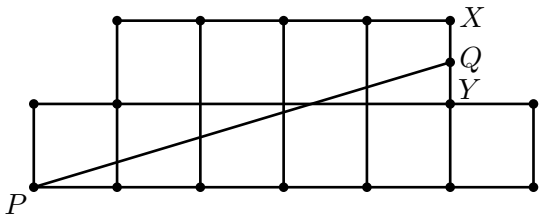

**(A)** $\frac{3}{5}$ **(B)** $\frac{2}{3}$ **(C)** $\frac{3}{4}$ **(D)** $\frac{5}{6}$ **(E)** $\frac{7}{8}$

**12.** (2004 AMC 8, Problem #24) In the figure, $ABCD$ is a rectangle and $EFGH$ is a parallelogram. Using the measurements given in the figure, what is the length $d$ of the segment that is perpendicular to $\overline{HE}$ and $\overline{FG}$?



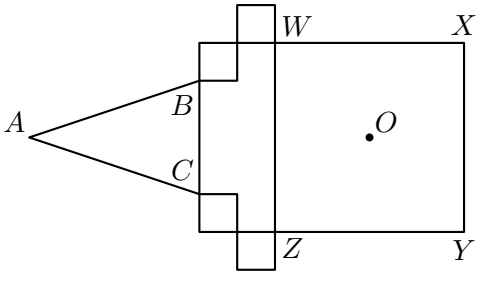

**(A)** 6.8 **(B)** 7.1 **(C)** 7.6 **(D)** 7.8 **(E)** 8.1

**13.** (2010 AMC 8, Problem #17) The diagram shows an octagon consisting of 10 unit squares. The portion below $\overline{PQ}$ is a unit square and a triangle with base 5. If $\overline{PQ}$ bisects the area of the octagon, what is the ratio $\dfrac{XQ}{QY}$?



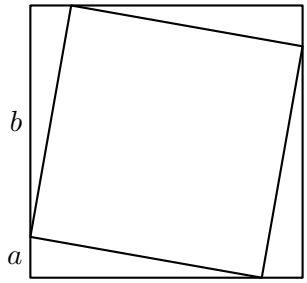

**(A)** $\frac{2}{5}$ **(B)** $\frac{1}{2}$ **(C)** $\frac{3}{5}$ **(D)** $\frac{2}{3}$ **(E)** $\frac{3}{4}$

**14.** (2003 AMC 8, Problem #25) In the figure, the area of square $WXYZ$ is 25 cm$^2$. The four smaller squares have sides 1 cm long, either parallel to or coinciding with the sides of the large square. In $\triangle ABC$, $AB = AC$, and when $\triangle ABC$ is folded over side $\overline{BC}$, point $A$ coincides with $O$, the center of square $WXYZ$. What is the area of $\triangle ABC$, in square centimeters?




**(A)** $\frac{15}{4}$ **(B)** $\frac{21}{4}$ **(C)** $\frac{27}{4}$ **(D)** $\frac{21}{2}$ **(E)** $\frac{27}{2}$

**15.** (2012 AMC 8, Problem #25) A square with area 4 is inscribed in a square with area 5, with one vertex of the smaller square on each side of the larger square. A vertex of the smaller square divides a side of the larger square into two segments, one of length $a$ and the other of length $b$. What is the value of $ab$?




**(A)** $\frac{1}{5}$ **(B)** $\frac{2}{5}$ **(C)** $\frac{1}{2}$ **(D)** 1 **(E)** 4

## 2. Answer Key

| Problem | Letter | Value |
|---|---|---|
| 1 | E | 150 |
| 2 | D | 64 |
| 3 | B | 6 |
| 4 | C | 4.5 |
| 5 | D | $\frac{7}{16}$ |
| 6 | C | 9 |
| 7 | C | $22\frac{1}{2}$ |
| 8 | B | $\frac{1}{2}(a+b)^2$ |
| 9 | D | 10.8 |
| 10 | C | 40 |
| 11 | D | $\frac{5}{6}$ |
| 12 | C | 7.6 |
| 13 | D | $\frac{2}{3}$ |
| 14 | C | $\frac{27}{4}$ |
| 15 | C | $\frac{1}{2}$ |