LESSON MAKER PRO

Coordinate Design Lab

Find the distance around a design and the space inside it.

HIGH SCHOOL · GDA.GM.B.18

GDA.GM.B.18 "Given the coordinates of the vertices of a polygon, compute its perimeter and area using a variety of methods, including the distance formula and dynamic geometry software, and evaluate the accuracy of the results."

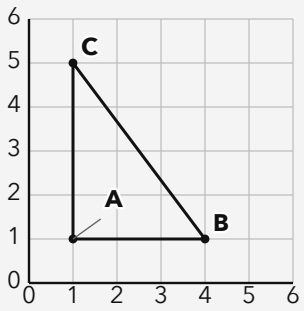
NAME _____ DATE _____

TWO MEASUREMENTS

For a slanted side, use d = sqrt((change in x)^2 + (change in y)^2). Add the side lengths for perimeter, and use a base and perpendicular height for area.

WORKED EXAMPLE

Find the perimeter and area of the triangle shown.



1. AB = 3 and AC = 4.
2. BC = sqrt(3^2 + 4^2) = 5.
3. Perimeter = 3 + 4 + 5 = 12. Area = (3 × 4)/2 = 6.

Answer: Perimeter: 12 units; area: 6 square units.

PRACTICE 4 problems

1 Find the perimeter and area of rectangle A(0,0), B(8,0), C(8,3), D(0,3).

ANSWER _____

2 Find the perimeter and area of triangle A(0, 0), B(12,0), C(0,9).

ANSWER _____

3 Find the perimeter and area of parallelogram A(0,0), B(9,0), C(12,4), D(3,4).

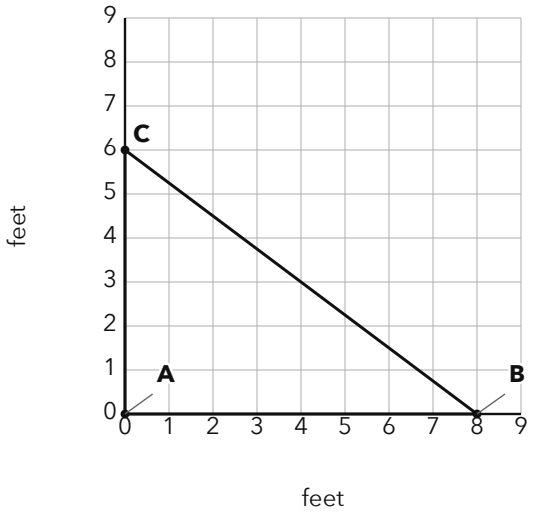
ANSWER _____

4 Find the perimeter and area of trapezoid A(0,0), B(14,0), C(11,4), D(3,4).

ANSWER _____

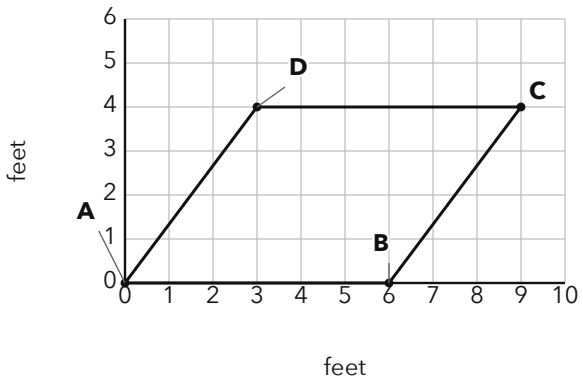
APPLY IT Show your work

1 An art club cuts the banner shown. Each grid unit is 1 foot. How many feet of edge trim and how many square feet of fabric does it need?



ANSWER _____

2 A gaming club tapes off the floor zone shown. Each grid unit is 1 foot. How much tape and how much floor space does it need?



ANSWER _____

CHALLENGE One step up

A design app reports a perimeter of 9 units and an area of 2 square units for triangle A(0,0), B(4,0), C(2, 1). Find the exact perimeter and area. Explain which app result is exact.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the perimeter and area of rectangle A(0,0), B(8,0), C(8,3), D(0, 3).	**Perimeter: 22 units; area: 24 square units.**
2	Find the perimeter and area of triangle A(0,0), B(12,0), C(0,9).	**Perimeter: 36 units; area: 54 square units.**
3	Find the perimeter and area of parallelogram A(0,0), B(9,0), C(12, 4), D(3,4).	**Perimeter: 28 units; area: 36 square units.**
4	Find the perimeter and area of trapezoid A(0,0), B(14,0), C(11,4), D(3,4).	**Perimeter: 32 units; area: 44 square units.**

PART 2 · APPLY IT

1. **24 feet of trim; 24 square feet of fabric.** The side lengths are 8, 6, and 10 feet, so the perimeter is 24 feet. The area is (8 × 6)/2 = 24 square feet.
2. **22 feet of tape; 24 square feet of floor space.** The sides are 6 and 5 feet long, giving a perimeter of 2(6 + 5) = 22 feet. The area is 6 × 4 = 24 square feet.

CHALLENGE

Perimeter: 4 + 2sqrt(5) units; area: 2 square units. Only the area is exact. Each slanted side is sqrt(5), so the perimeter is not 9.

Accept equivalent exact expressions for the challenge perimeter. The app's perimeter is an approximation, not an exact value.