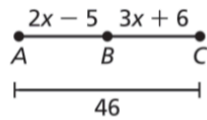


Geometry Summer Work

Show all of your work for the questions in this packet. If you have no work to show, at least explain your thinking.

Segment Addition

Segment Addition Postulate: If points A , B , and C are collinear and B is between A and C , then $AB + BC = AC$.

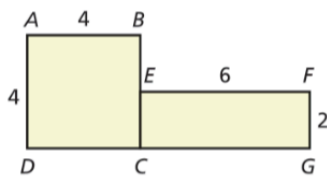


$$\begin{aligned} AB + BC &= AC \\ 2x - 5 + 3x + 6 &= 46 \\ 5x + 1 &= 46 \\ 5x &= 45 \\ x &= 9 \end{aligned}$$

$$AB = 2 \cdot 9 - 5 = 13 \text{ and } BC = 3 \cdot 9 + 6 = 33.$$

Area

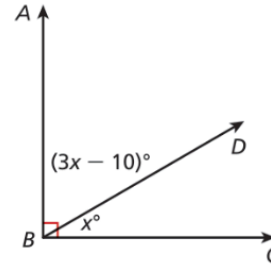
Area Addition Postulate: If a figure is formed by two or more shapes that do not overlap, the area of the figure is the sum of the areas of the individual shapes.



$$\begin{aligned} \text{Area} &= ABCD + EFGC \\ &= 4 \cdot 4 + 6 \cdot 2 \\ &= 16 + 12 \\ &= 28 \text{ square units} \end{aligned}$$

Angle Addition

Angle Addition Postulate: If D is in the interior of $\angle ABC$, then $m\angle ABC = m\angle ABD + m\angle CBD$.

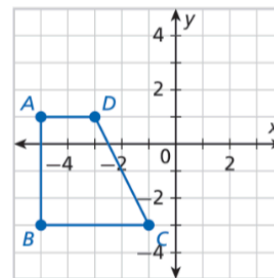


$$\begin{aligned} m\angle ABC &= m\angle ABD + m\angle CBD \\ 90 &= (3x - 10) + x \\ 90 &= 4x - 10 \\ 25 &= x \end{aligned}$$

$$m\angle ABD = 3 \cdot 25 - 10 = 65^\circ \text{ and } m\angle CBD = 25^\circ.$$

Perimeter

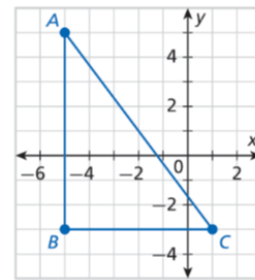
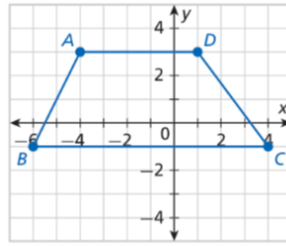
The Distance Formula can be used to find lengths on the coordinate plane.



$$\begin{aligned} DC &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\ &= \sqrt{(-1 - (-3))^2 + ((-3) - 1)^2} \\ &= \sqrt{20} \approx 4.5 \end{aligned}$$

$$\text{Perimeter} \approx 2 + 4 + 4 + 4.5 = 14.5 \text{ units}$$

1. Find the area of the figures



2. Sam lives exactly halfway between his friends, Danny and Leo. Danny's house is located at the point $(-4, 4)$ and Leo lives at the point $(9, -8)$. At what point is Sam's house located?

3. Two angles are supplementary. The measure of $\angle ABD$ is $(2x - 9)^\circ$ and the measure of $\angle CBD$ is $(4x + 12)^\circ$. What are measurements of the two angles?

4. On July 4, 2017, the United States of America had a population of 325.7 million people. The total land area of the United States is 3,535,932 square miles. What was the population density of the United States on July 4, 2017?

- Liam is putting up a fence around a garden. He has poles located at $A(7, 7)$, $B(16, 7)$, $C(2, 2)$, and $D(16, 2)$. Each unit on his coordinate grid represents 1 foot. How many feet of fencing does he need to fence in the garden?

7. Determine if each statement provides enough information to find the value. If yes, find the value.

a. The area of a triangle with a hypotenuse of 5 ft

b. The perimeter of a regular pentagon with a side length of 3 m

c. The width of a rectangle with an area of 24 sq in and length of 6 in

d. The side length of a square with an area of 64 sq ft

8. Find the midpoint M of a segment with the given endpoints

a. $(-4, 6)$ and $(2, 8)$

b. $(-4, 0)$ and $(0, -10)$

c. $(-5, -3)$ and $(3, 7)$

d. $(-9, 11)$ and $(-13, 1)$

e. $(-7, 3)$ and $(2, -8)$

f. $(-8, 11)$ and $(-3, 12)$

9. Find the area of the triangle with given base and height
- 2 cm and 7.5 cm

b. 6.6 ft and 7 ft

c. 3 m and 10.5 m