



Perimeter and Area of Plane Figures

Answer Key

1) Answer: D

Explanation: The area of a square is just the square of the measurement of its side (or multiplying the measurement of the side to itself). If the side of the square in the problem has a measurement of $x - 9$ cm, then its area is just the square of $x - 9$ or $(x - 9)^2$

$$(x - 9)^2 = x^2 - 18x + 81 \quad \text{Using special products for expanding the square of a binomial}$$

So, the area of the square is $x^2 - 18x + 81$ cm².

Take note that option (a) is not an acceptable answer because its unit is just centimeters (cm). Recall that when writing the area of a plane figure, we express the given units in square units. So, our answer to this problem must be the one in square centimeters, which is in option (d).

2) Answer: C

Explanation: The area of the shaded region can be obtained by subtracting the area of the smaller triangle from the area of the larger triangle.

$$A_{\text{shaded region}} = A_{\text{larger triangle}} - A_{\text{smaller triangle}}$$

We must determine first the respective areas of the larger triangle and the smaller triangle.

According to the problem, the larger triangle is 20 cm, and it has a base of 10 cm. So, we have

$$h = 20 \text{ and } b = 10$$

The formula for the area of a triangle is $A = \frac{1}{2} bh$

Let us compute the area of the larger triangle using the given above:

$$A_{\text{larger triangle}} = \frac{1}{2} (20)(10) = 100$$



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So, the area of the larger triangle is 100 cm^2 .

Let us compute now for the area of the smaller triangle.

According to the given problem, the triangle is 12 cm high and has a base 7 cm long. So, we have:

$$h = 12 \text{ and } b = 7$$

Let us compute for the area of the smaller triangle using the given above:

$$A_{\text{smaller triangle}} = \frac{1}{2} bh$$

$$A_{\text{smaller triangle}} = \frac{1}{2} (12)(7) = 42$$

So, the area of the smaller triangle is 42 cm^2 .

To find the area of the shaded region, we just subtract the areas of the larger and the smaller triangle:

$$A_{\text{shaded region}} = A_{\text{larger triangle}} - A_{\text{smaller triangle}}$$

$$A_{\text{shaded region}} = 100 \text{ cm}^2 - 42 \text{ cm}^2$$

$$A_{\text{shaded region}} = 58 \text{ cm}^2$$

Thus, the area of the shaded region is 58 cm^2 .



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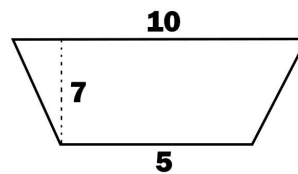
Answer Key

3) Answer: A

Explanation: The formula for the area of a trapezoid can be calculated using the formula:

$$A_{\text{trapezoid}} = \frac{1}{2} (b_1 + b_2)h$$

Let us take a look again at the given trapezoid:



The lengths of the bases of the trapezoid are $b_1 = 5$ and $b_2 = 10$. The height of the trapezoid is $h = 7$ cm.

Using the formula:

$$A_{\text{trapezoid}} = \frac{1}{2} (b_1 + b_2)h$$

$$A_{\text{trapezoid}} = \frac{1}{2} (5 + 10)7$$

$$A_{\text{trapezoid}} = \frac{1}{2} (15)7$$

$$A_{\text{trapezoid}} = 3.5(15) = 52.5$$

Thus, the area of the trapezoid is 52.5 cm^2 .



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4) Answer: A

Explanation: We can derive the perimeter of the given geometric figure just by adding the lengths of its sides:

$$P = 8 + 3 + 12 + 15 + 5 = 43$$

Thus, the perimeter of the geometric figure given is 43 cm.

5) Answer: B

Explanation: The perimeter of a rectangle can be calculated using the formula:

$$P = 2l + 2w$$

where l is the length and w is the width of the rectangle.

The given length in the problem is $l = 5$ cm while the given width is $w = 4$ cm.

Substituting these values to the formula above:

$$\begin{aligned} P &= 2l + 2w \\ P &= 2(5) + 2(4) \\ P &= 10 + 8 \\ P &= 18 \end{aligned}$$

Hence, the perimeter of the rectangle is 18 cm



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