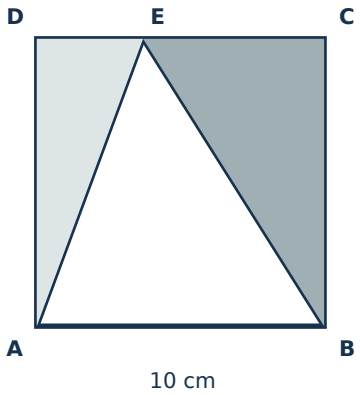
1 A moving point

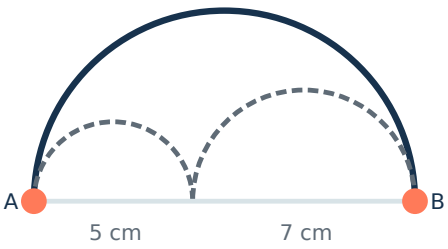
In square ABCD with side 10 cm, E can be anywhere on side DC. Find the total area of the two grey triangles.



SOLUTION / ANSWER

2 Race along arcs

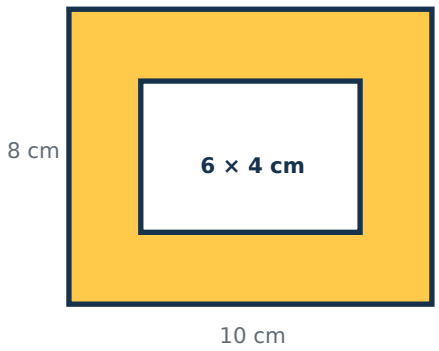
From A to B, take the large semicircle or the two small ones. Diameter AB is 12 cm, split into 5 and 7 cm. Which route is shorter?



SOLUTION / ANSWER

3 Area of a frame

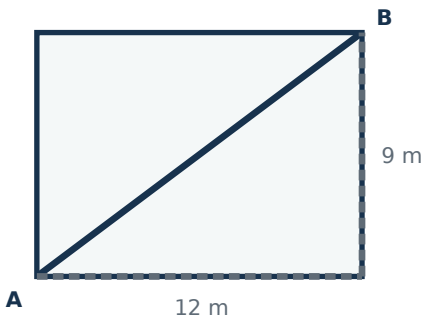
The outer rectangle measures 10 × 8 cm, the inner one 6 × 4 cm. Find the frame's area.



SOLUTION / ANSWER

4 Two routes

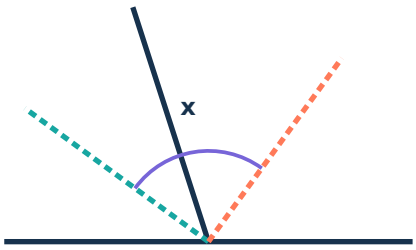
A and B are opposite corners of a 12 × 9 m rectangular yard. How much shorter is the diagonal route than the route along two sides?



SOLUTION / ANSWER

5 Two bisectors

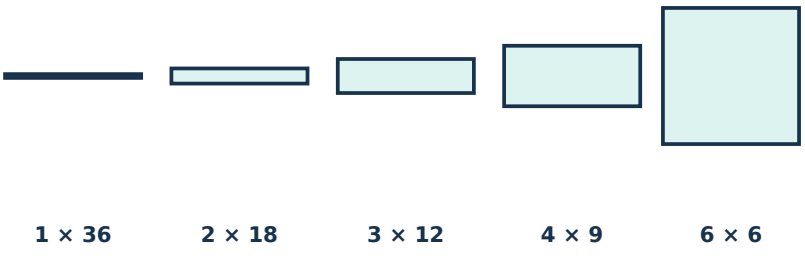
A ray divides a straight angle into two adjacent angles. Both are bisected. Find angle x between the bisectors.



SOLUTION / ANSWER

6 The best rectangle

All these rectangles have area 36 cm². Which has the smallest perimeter? What is it?



SOLUTION / ANSWER

Answers and explanations

Try the puzzles first, then compare your reasoning with the explanations.

1 A moving point

50 cm², wherever E is placed.
Both shaded triangles have height 10 cm, and their bases add up to DE + EC = 10 cm. Their total area is (DE + EC) × 10 / 2 = 50 cm².

2 A race along arcs

The paths are equal: 6π cm each.
A semicircle has arc length π × diameter / 2. The large arc is 12π / 2 = 6π. The two smaller arcs total (5 + 7)π / 2 = 6π, about 18.85 cm.

3 Area of a frame

56 cm².
Subtract the inner rectangle from the outer one: 10 × 8 - 6 × 4 = 80 - 24 = 56 cm².

Answers and explanations

Continued: puzzles 4-6

4 Two routes

The diagonal is 6 m shorter.
Along the sides: 12 + 9 = 21 m. By Pythagoras, the diagonal is $\sqrt{(12^2 + 9^2)} = \sqrt{225}$ = 15 m. Difference: 21 - 15 = 6 m.

5 Two angle bisectors

90°.
The two adjacent angles add up to 180°. Each bisector halves its angle, so the angle between the bisectors is half their sum: 180° / 2 = 90°.

6 The best rectangle

The 6 × 6 cm square; perimeter 24 cm.
Use P = 2 × (a + b) for each pair of sides. The five shown perimeters are 74, 40, 30, 26 and 24 cm. The square has the smallest perimeter.

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