# Perimeter & Fractions

# Tutorials: 8, 10, 15, 16, 17, 18, 46, 48

## 1. Fencing (6 marks)

A garden is in the shape of a rectangle with a semi-circular lawn at one end.

The rectangle is 15 m long and 10 m wide, with the semicircle of diameter 10 m attached to one 10 m end.

The owner wants to fence around the entire garden except for a gate opening that is ¼ of the total perimeter.

a. Calculate the total perimeter of the garden (the length of fencing if there were no gate). Use $\pi = 3.14$ in your calculations.

b. Determine the length of fencing needed if ¼ of the perimeter is left open for the gate. (In other words, only ¾ of the perimeter will be fenced.)

## 2. Fencing (6 marks)

A garden is in the shape of a rectangle with a semi-circular lawn at one end.

The rectangle is 20 m long and 5 m wide, with the semicircle of diameter 5 m attached to one 5 m end.

The owner wants to fence around the entire garden except for a gate opening that is ⅛ of the total perimeter.

a. Calculate the total perimeter of the garden (the length of fencing if there were no gate). Use $\pi = 3.14$ in your calculations.

b. Determine the length of fencing needed if ⅛ of the perimeter is left open for the gate.

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## 3. Shop Sign (6 marks)

A shop sign is shaped as a rectangle topped by a semi-circle (like an arch).

The rectangular part is 2.4 m wide and 1.2 m tall, and a semicircle with diameter 2.4 m sits on top.

The owner is adding a border around the edge of this sign. They will paint ⅔ of the border gold and the remaining ⅓ silver.

a. Work out the total length of the sign's border (perimeter of the entire shape). Use π = 3.14 as needed.

b. Calculate how many meters of border will be painted gold and how many meters silver based on the fractions given.

## 4. Shop Sign (6 marks)

A shop sign is shaped as a rectangle topped by a semi-circle (like an arch).

The rectangular part is 2.4 m wide and 1.2 m tall, and a semicircle with diameter 2.4 m sits on top.

The owner is adding a border around the edge of this sign. They will paint ⅔ of the border gold and the remaining ⅓ silver.

a. Work out the total length of the sign's border (perimeter of the entire shape). Use π = 3.14 as needed.

b. Calculate how many meters of border will be painted gold and how many meters silver based on the fractions given.

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## *5.* Running Track (6 marks)

An athletics running track is shaped with two semi-circles at the ends and two straight parallel sides.

The straight sections are each 80 m, and the semi-circular ends each have a radius of 20 m.

a. Calculate the perimeter length of one lap around the track. Use $\pi = 3.14$.

b. In a race, a runner completes 1½ laps of this track. Determine the distance the runner covers in meters.

## *5.* Running Track (6 marks)

An athletics running track is shaped with two semi-circles at the ends and two straight parallel sides.

The straight sections are each 100 m, and the semi-circular ends each have a radius of 15 m.

a. Calculate the perimeter length of one lap around the track. Use $\pi = 3.14$.

b. In a race, a runner completes $2\frac{3}{5}$ laps of this track. Determine the distance the runner covers in meters.

## *6*. Logo (6 marks)

A company logo is a compound shape made by joining a semicircle to the top of an isosceles triangle. The flat diameter of the semicircle matches the base of the triangle (7 cm). The triangle's other two sides are 8 cm each. The logo's edge will be trimmed with a decorative strip.

a. Determine the total perimeter of the logo shape (the semicircular arc plus the two equal triangle sides). Leave your answer in terms of π.

b. If the decorative strip covers ⅗ of the perimeter of the logo, calculate how many centimeters of the strip are used and how many centimeters of the edge remain untrimmed.

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## *8*. Logo (6 marks)

A company logo is a compound shape made by joining a semicircle to the top of an isosceles triangle. The flat diameter of the semicircle matches the base of the triangle (9 cm). The triangle's other two sides are 2 ⅗ cm each. The logo's edge will be trimmed with a decorative strip.

a. Determine the total perimeter of the logo shape (the semicircular arc plus the two equal triangle sides). Leave your answer in terms of π.

b. If the decorative strip covers ⅒ of the perimeter of the logo, calculate how many centimeters of the strip are used and how many centimeters of the edge remain untrimmed.

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## 7. Country Park (6 marks)

A country park is designed in a compound shape combining three parts: a 2⅗ km by 3¼ km rectangle, a semicircular seating area on one 2⅗ km end (diameter = 2⅗ km), and an triangular flower bed attached along one 3¼ km side (base of triangle = 3¼ km, and the other two sides are 5 km each). The plan is to build a low fence around the entire outer edge of this park.

Calculate the perimeter of the park's shape (sum of the rectangle's remaining sides, the semicircle's arc, and the two sides of the triangle that are exposed). Leave your answer in terms of π

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## 7. Country Park (6 marks)

A country park is designed in a compound shape combining three parts: a 2⅙ km by 3⅓ km rectangle, a semicircular seating area on one 2⅙ km end (diameter = 2⅙ km), and an triangular flower bed attached along one 3⅓ km side (base of triangle = 3⅓ km, and the other two sides are 3 km each). The plan is to build a low fence around the entire outer edge of this park.

Calculate the perimeter of the park's shape (sum of the rectangle's remaining sides, the semicircle's arc, and the two sides of the triangle that are exposed). Leave your answers in terms of π