Perimeter and area of composite shapes involving circles

Mana Maths

Te reo Māori terms

āhua
composite shape
Open in Te Aka

porowhita
circle
Open in Te Aka

porowhita hauwhā
quadrant
Open in Te Aka

pewa
arc
Open in Te Aka

Perimeter and area of composite shapes involving circles — Foundation

1. A rectangle is 8 cm by 4 cm with a semicircle of diameter 4 cm attached to one short side. Find the perimeter. Use $\pi \approx 3.14$.

2. A rectangle is 8 cm by 4 cm with a semicircle of diameter 4 cm attached to one short side. Find the area. Use $\pi \approx 3.14$.

3. A square of side 8 m has a quarter circle of radius 4 m cut from one corner. Find the remaining area. Use $\pi \approx 3.14$.

4. A rectangle is 10 m by 5 m with a semicircle of diameter 5 m attached along one long side. Find the perimeter. Use $\pi \approx 3.14$.

5. A shape is made from a rectangle 12 cm by 6 cm with a semicircle of diameter 6 cm attached to one short side. Find its area. Use $\pi \approx 3.14$.

6. A shape is made from a rectangle 12 cm by 6 cm with a semicircle of diameter 6 cm attached to one short side. Find its perimeter. Use $\pi \approx 3.14$.

7. A square of side 10 cm has a semicircle of diameter 10 cm attached along one side. Find the total perimeter. Use $\pi \approx 3.14$.

8. A square of side 10 cm has a semicircle of diameter 10 cm attached along one side. Find the total area. Use $\pi \approx 3.14$.

9. A quarter circle of radius 7 cm is cut from a rectangle 7 cm by 9 cm. Find the remaining area. Use $\pi \approx 3.14$.

10. A quarter circle of radius 7 cm is cut from a rectangle 7 cm by 9 cm. Find the perimeter of the remaining shape. Use $\pi \approx 3.14$.

11. A running lane has two straight sides of 20 m and two semicircular ends of diameter 8 m. Find the perimeter. Use $\pi \approx 3.14$.

12. A running lane has two straight sides of 20 m and two semicircular ends of diameter 8 m. Find the area inside the lane. Use $\pi \approx 3.14$.

Perimeter and area of composite shapes involving circles — Proficient

1. A rectangle is 12 cm by 6 cm with a semicircle of diameter 6 cm attached to one short side. Find the perimeter in terms of π.

2. A rectangle is 12 cm by 6 cm with a semicircle of diameter 6 cm attached to one short side. Find the area in terms of π.

3. A square of side 14 m has four quarter circles of radius 7 m drawn at the corners, making one full circle inside the square. Find the shaded area left inside the square but outside the circle. Give the exact answer in terms of π.

4. A square of side 14 m has four quarter circles of radius 7 m drawn at the corners, making one full circle inside the square. Find the total curved length. Give the exact answer in terms of π.

5. A stadium shape has two straight sides of 18 cm and two semicircular ends of radius 4 cm. Find its perimeter in terms of π.

6. A stadium shape has two straight sides of 18 cm and two semicircular ends of radius 4 cm. Find its area in terms of π.

7. A rectangle is 16 cm by 10 cm. A semicircle of diameter 10 cm is cut out from one short side. Find the remaining perimeter in terms of π.

8. A rectangle is 16 cm by 10 cm. A semicircle of diameter 10 cm is cut out from one short side. Find the remaining area in terms of π.

9. A square of side 12 cm has a quarter circle of radius 12 cm cut off from one corner. Find the perimeter of the remaining shape in terms of π.

10. A square of side 12 cm has a quarter circle of radius 12 cm cut off from one corner. Find the remaining area in terms of π.

11. A running track has two straight sections of 60 m and two semi-circular ends of diameter 30 m. Find the total length of one lap in terms of π.

12. A running track has two straight sections of 60 m and two semi-circular ends of diameter 30 m. Find the area enclosed by the inside edge in terms of π.

Perimeter and area of composite shapes involving circles — Excellence

1. A stadium shape has perimeter $56 + 16\pi$ cm. Each semicircular end has radius 8 cm. Find the length of one straight side.

2. A stadium shape has straight sides of 24 m and semicircular ends of radius 6 m. Find the area enclosed. Give the exact answer in terms of π.

3. A rectangle 20 cm by 12 cm has a semicircle of diameter 12 cm attached externally to one short side. Find the perimeter and the area in terms of π.

4. A rectangle 18 cm by 10 cm has a semicircle of diameter 10 cm cut out from one short side. Find the perimeter and the remaining area in terms of π.

5. A square of side 16 cm has a quarter circle of radius 16 cm removed from one corner. Find the perimeter of the remaining shape in terms of π.

6. A square of side 16 cm has a quarter circle of radius 16 cm removed from one corner. Find the remaining area in terms of π.

7. Two semicircles of diameter 10 cm are attached to opposite short sides of a rectangle 18 cm by 10 cm. Find the perimeter in terms of π.

8. Two semicircles of diameter 10 cm are attached to opposite short sides of a rectangle 18 cm by 10 cm. Find the area in terms of π.

9. A square has side 14 m. Four quarter circles of radius 7 m are drawn inside it to make one full circle. Find the fraction of the square that is not part of the circle.

10. A shape is made from a semicircle of radius 9 cm on top of a rectangle 18 cm by 9 cm. If fencing costs 12 dollars per cm around the outside edge, find the total fencing cost in terms of π.

11. A running track has area $1800 + 225\pi$ m^2. The two semicircular ends each have radius 15 m. Find the length of one straight section.

12. A rectangle is 30 cm by 14 cm. A semicircle of diameter 14 cm is attached to one short side and an identical semicircle is cut from the opposite short side. Find the total area of the final shape.

13. A rectangle is 30 cm by 14 cm. A semicircle of diameter 14 cm is attached to one short side and an identical semicircle is cut from the opposite short side. Find the perimeter of the final shape in terms of π.

14. A square of side 20 cm has a quarter circle of radius 10 cm removed from each corner. Find the remaining area in terms of π.

15. A square of side 20 cm has a quarter circle of radius 10 cm removed from each corner. Find the perimeter of the remaining central shape in terms of π.

16. A capsule-shaped logo has area $300 + 36\pi$ cm^2. The two semicircular ends each have radius 6 cm. Find the length of the rectangle part.