

Grade 7 · Circumference and Area of Circles · Test Answer Key

Common Core 7.G.B.4 · mathovore.fr

Use this key to score the test out of 20 points. Each solution uses $\pi = 3.14$ unless the question asks for π in the answer, and the scoring note explains how partial credit is given. Accept any correct method, and award full credit when the answer has the right units.

Grade 7 Common Core: 7.G.B.4

Question 1: Radius, diameter, and pi (2 points)

(a) $d = 2 \times 9 = 18 \text{ cm}.$

(b) $C = 2\pi r = 2 \times 9 \times \pi = 18\pi \text{ cm}.$

Scoring: 1 point for each part.

Question 2: Circumference of a round table (2 points)

$$C = \pi d = 3.14 \times 15 = 47.1.$$

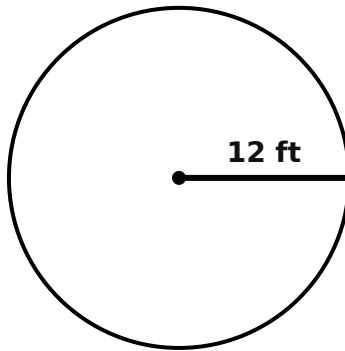
47.1 ft

Scoring: 1 point for the correct formula and substitution; 1 point for 47.1 ft.

Question 3: Area of a circle (2 points)

$$A = \pi r^2 = 3.14 \times 12^2 = 3.14 \times 144 = 452.16.$$

452.16 ft²



Solved: $A = 3.14 \text{ times } 144 = 452.16 \text{ square feet.}$

Scoring: 1 point for squaring the radius (144); 1 point for 452.16 ft^2 with square units.

Question 4: From circumference to area (3 points)

$d = C \div \pi = 37.68 \div 3.14 = 12$, so $r = 6 \text{ in.}$

$A = 3.14 \times 6^2 = 3.14 \times 36 = 113.04.$

Radius 6 in; **area** 113.04 in^2

Scoring: 1 point for the diameter 12; 1 point for the radius 6; 1 point for 113.04 in^2 .

Question 5: Why the area formula works (2 points)

The base is half the circumference: $\frac{1}{2} \times 2\pi r = \pi r$. The height is the radius, r .

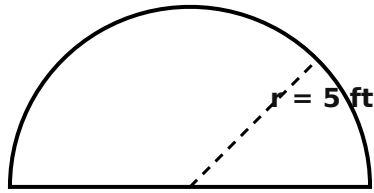
Area = base $\times$ height $= \pi r \times r = \pi r^2$.

Scoring: 1 point for base πr and height r ; 1 point for the product πr^2 .

Question 6: Semicircle (3 points)

$r = 5$. Area: $\frac{1}{2} \times 3.14 \times 25 = 39.25 \text{ ft}^2$.

Perimeter: half the circumference $\frac{1}{2} \times 3.14 \times 10 = 15.7$, plus the diameter 10: 25.7 ft .



diameter 10 ft

Solved: radius 5 ft.

Scoring: 1 point for the radius 5; 1 point for the area 39.25 ft^2 ; 1 point for the perimeter 25.7 ft including the diameter.

Question 7: Comparing pizzas (3 points)

Small: $r = 6$, $A = 3.14 \times 36 = 113.04$. Large: $r = 8$, $A = 3.14 \times 64 = 200.96$.

Difference: $200.96 - 113.04 = 87.92$.

87.92 in^2 more

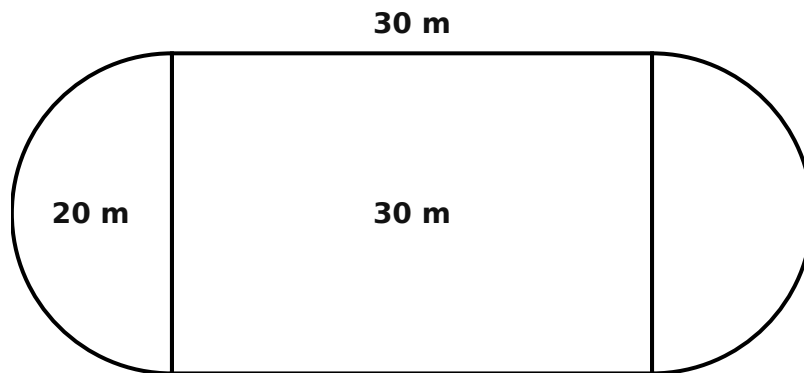
Scoring: 1 point for each correct area; 1 point for the difference 87.92 in^2 .

Question 8: Running track (3 points)

The two semicircles form one circle with diameter 20 and radius 10.

(a) Perimeter: two straight sides 60 plus $C = 3.14 \times 20 = 62.8$: 122.8 m .

(b) Area: rectangle $30 \times 20 = 600$ plus circle $3.14 \times 100 = 314$: 914 m^2 .



Solved: two semicircles make one circle of radius 10 m.

Scoring: 1 point for recognizing the circle of radius 10; 1 point for 122.8 m ; 1 point for 914 m^2 .

Total
20 points