#### Study Island: Area, Perimeter & Circumference

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Generation Date: **02/13/2013**   
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**1.**

What is the approximate perimeter of the figure above?

|  |  |  |
| --- | --- | --- |
|  | **A.** | 35.3 in |

|  |  |  |
| --- | --- | --- |
|  | **B.** | 36.1 in |

|  |  |  |
| --- | --- | --- |
|  | **C.** | 40.8 in |

|  |  |  |
| --- | --- | --- |
|  | **D.** | 30.6 in |

**2.**

What is the approximate circumference of the circle above?

|  |  |  |
| --- | --- | --- |
|  | **A.** | 4.7 ft |

|  |  |  |
| --- | --- | --- |
|  | **B.** | 11.3 ft |

|  |  |  |
| --- | --- | --- |
|  | **C.** | 7.1 ft |

|  |  |  |
| --- | --- | --- |
|  | **D.** | 9.4 ft |

**3.**

What is the approximate perimeter of the figure above?

|  |  |  |
| --- | --- | --- |
|  | **A.** | 25.5 in |

|  |  |  |
| --- | --- | --- |
|  | **B.** | 26.5 in |

|  |  |  |
| --- | --- | --- |
|  | **C.** | 31.5 in |

|  |  |  |
| --- | --- | --- |
|  | **D.** | 29.5 in |

**4.**

|  |  |  |
| --- | --- | --- |
|  | **A.** |  |

|  |  |  |
| --- | --- | --- |
|  | **B.** |  |

|  |  |  |
| --- | --- | --- |
|  | **C.** |  |

|  |  |  |
| --- | --- | --- |
|  | **D.** |  |

**5.**

|  |  |  |
| --- | --- | --- |
|  | **A.** |  |

|  |  |  |
| --- | --- | --- |
|  | **B.** |  |

|  |  |  |
| --- | --- | --- |
|  | **C.** |  |

|  |  |  |
| --- | --- | --- |
|  | **D.** |  |

**6.**

*\*Note: Picture not drawn to scale.*

In the figure above, the radius of circle *C* is 3 cm. What is the approximate area of the shaded region?

|  |  |  |
| --- | --- | --- |
|  | **A.** | 69 cm2 |

|  |  |  |
| --- | --- | --- |
|  | **B.** | 28.3 cm2 |

|  |  |  |
| --- | --- | --- |
|  | **C.** | 53.1 cm2 |

|  |  |  |
| --- | --- | --- |
|  | **D.** | 12.4 cm2 |

**7.**

|  |  |  |
| --- | --- | --- |
|  | **A.** |  |

|  |  |  |
| --- | --- | --- |
|  | **B.** |  |

|  |  |  |
| --- | --- | --- |
|  | **C.** |  |

|  |  |  |
| --- | --- | --- |
|  | **D.** |  |

**8.**

Estimate the perimeter of the figure above.

|  |  |  |
| --- | --- | --- |
|  | **A.** | 44 m |

|  |  |  |
| --- | --- | --- |
|  | **B.** | 30 m |

|  |  |  |
| --- | --- | --- |
|  | **C.** | 38 m |

|  |  |  |
| --- | --- | --- |
|  | **D.** | 22 m |

**9.**

|  |  |
| --- | --- |
|  |  |
|  |  |

|  |  |  |
| --- | --- | --- |
|  | **A.** |  |

|  |  |  |
| --- | --- | --- |
|  | **B.** |  |

|  |  |  |
| --- | --- | --- |
|  | **C.** |  |

|  |  |  |
| --- | --- | --- |
|  | **D.** |  |

**10.**

|  |  |  |
| --- | --- | --- |
|  | **A.** |  |

|  |  |  |
| --- | --- | --- |
|  | **B.** |  |

|  |  |  |
| --- | --- | --- |
|  | **C.** |  |

|  |  |  |
| --- | --- | --- |
|  | **D.** |  |

# Answers

1. D   
2. D   
3. D   
4. B   
5. B   
6. D   
7. A   
8. C   
9. C   
10. A

# Explanations

1. The figure is made up of two overlapping circles. The perimeter of the figure is made up of about of each circle's circumference.  
  
Use the length of one grid square to estimate the diameter of each circle.

The diameter of the smaller circle is about 6 in, so its radius is about  
3 in. The diameter of the larger circle is about 7 in, so its radius is about 3.5 in.  
  
Use the circumference formula to find the approximate circumferences of the circles.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| smaller circle: |  | *C* | = | 2*r* |
|  |  |  |  | 2(3.14)(3 in) |
|  |  |  |  | 18.8 in |
| larger circle: |  | *C* | = | 2*r* |
|  |  |  |  | 2(3.14)(3.5 in) |
|  |  |  |  | 22 in |

Then, use the approximate circumferences to estimate the perimeter of the figure.

2. Use the lengths of the sides of the square to approximate the diameter of the circle.

Since the diameter of the circle is about 3 ft, its radius is about 1.5 ft. Use the circumference formula to approximate the circumference of the circle.

|  |  |  |
| --- | --- | --- |
| *C* | = | 2*r* |
|  |  | 2(3.14)(1.5 ft) |
|  |  | **9.4 ft** |

3. Use the lengths of the sides of the square to approximate the length of each side of the figure.

Then, add the approximate side lengths.

8.5 in + 8 in + 2 × 5 in + 3 in = **29.5 in**

4.

5.

6. To find the area of the shaded region, first find the area of the smaller circle.

Next, find the radius of the larger circle using the Pythagorean theorem.

Now, use radius of the larger circle to find the area of the larger circle.

Finally, subtract the area of the smaller circle from the area of the larger circle.

Therefore, the area of the shaded region is approximately **12.4 cm2**.

7.

8. The bottom of the figure is **8 meters** long.  
The left and right sides of the figure are each **9 meters** long.   
  
Next, estimate the length of the two top sections of the figure. Think of the sections as the **hypotenuse** of a right triangle with legs that are 4 meters long.

Each side is just a little less than 6 meters long. So, round the top section lengths to **6 meters**.  
  
Bottom = 8 m  
Left Side = 9 m  
Right side = 9 m  
Top left section = 6 m  
Top right section = 6 m  
  
Add the lengths together to find the perimeter.  
  
8 m + 9 m + 9m + 6 m + 6 m = **38 m**

9.

10.