Pi-Related Practice Questions

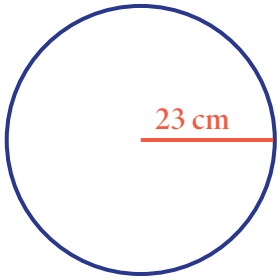
piday

For High School Math Students

1. Write the formulas used to find the circumference and area of a circle, respectively.

2. A circle has a radius of 23 cm. Which of the following is the best estimate for the circumference of the circle? Use 3.14 for π.

   a. 71.76 cm
   b. 143.52 cm
   c. 144.44 cm
   d. 72.22 cm

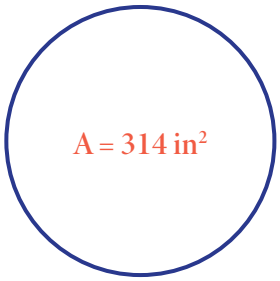


3. A pothole has a radius of 9 inches. Which of the following best represents the distance around the pothole? Use 3.14 for π.

   a. 14.13 in
   b. 28.26 in
   c. 42.39 in
   d. 56.52 in

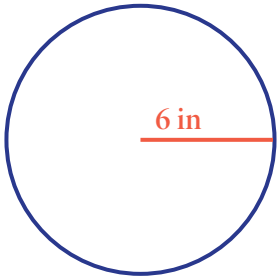
4. Which of the following values is closest to the diameter of a circle with an area of 314 square inches? Use 3.14 for π.

   a. 10 in
   b. 20 in
   c. 31.4 in
   d. 100 in



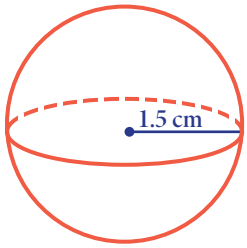
5. The radius of a circle is 6 inches. What is the area? Use 3.14 for π.

   a. 18.84 in^2
   b. 37.68 in^2
   c. 87.98 in^2
   d. 113.04 in^2



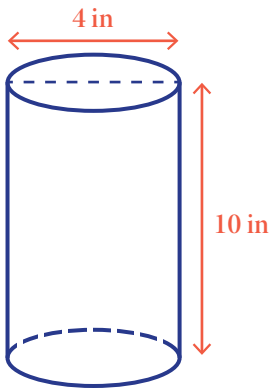
6. Find the surface area of a sphere with the radius of 1.5 cm. Use 3.14 for π.

a. 28.26 cm^2
b. 72.22 cm^2
c. 143.52 cm^2
d. 144.44 cm^2



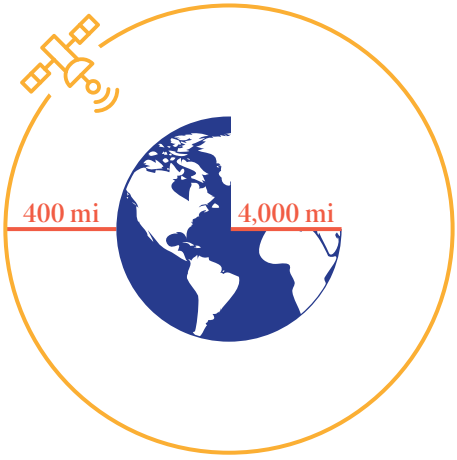
7. A cylindrical oatmeal canister has a diameter of 4 inches and a height of 10 inches. The manufacturing company wants to package the oatmeal in square containers to cut back on wasted storage space. If the new carton has a square base with 4-inch sides, what is the minimum height it must have, rounded up to the nearest $\frac{1}{4}$ inch, to hold the same volume of oatmeal? Use 3.14 for π.

a. $7\frac{3}{4}$ in
b. 8 in
c. $8\frac{1}{4}$ in
d. $8\frac{1}{2}$ in



8. A satellite in a circular orbit rotates around the Earth every 120 minutes. If the Earth's radius is 4,000 miles at sea level, and the satellite's orbit is 400 miles above sea level, approximately what distance does the satellite travel in 40 minutes? Use 3.14 for π.

a. 1,400 mi
b. 4,120 mi
c. 4,400 mi
d. 9,210 mi



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Answer Key

1. The formula used to find the circumference, C, of a circle is $C = 2\pi r$ or $C = \pi d$, where r is the radius of the circle and d its diameter. The formula used to find the area, A, of a circle is $A = \pi r^2$, where r is the radius of the circle.

2. **C:** The circumference of a circle can be determined by using the formula $C = 2\pi r$. Substitution of 23 cm for r and 3.14 for π gives the following: $C = 2(3.14)(23)$, which equals 144.44. Thus, the circumference of the circle is approximately 144.44 cm.

3. **D:** The distance around the pothole indicates the circumference of the pothole. The circumference of a circle can be determined by using the formula $C = 2\pi r$, where C represents the circumference and r represents the radius. Substituting a radius of 9 inches and 3.14 for the value of π gives the following: $C = 2(3.14)(9)$, or 56.52. Thus, the distance around the pothole is equal to 56.52 inches.

4. **B:** The area of a circle is given by $A = \pi r^2$, where r is the radius of the circle. Since π is approximately 3.14, we can solve for $r = \sqrt{\frac{A}{\pi}} = \sqrt{\frac{314}{3.14}} = \sqrt{100} = 10$. Now, the diameter is twice the radius: $d = 2 \times 10 = 20$. Thus, the diameter of the circle is 20 inches.

5. **D:** The formula for the area of a circle is $A = \pi r^2$.

$A = \pi r^2$
$A = (3.14)(6 \text{ in})^2$
$A = (3.14)(36 \text{ in}^2)$
$A = 113.04 \text{ in}^2$

6. **A:** The formula for the surface area of a sphere is $SA = 4\pi r^2$.

$SA = 4\pi r^2$
$SA = 4(3.14)(1.5 \text{ cm})^2$
$SA = 4(3.14)(2.25 \text{ cm}^2)$
$SA = 28.26 \text{ cm}^2$

7. **B:** Start by finding the volume of the existing oatmeal canister. The formula for the volume of a cylinder is $V = \pi r^2 h$. The diameter of the circle is 4. This makes the radius 2, and the total volume of the canister is $V = (3.14)(2)^2(10) = 125.6$.

   The area of the base of the new container is $A = s^2 = 4^2 = 16$. To find the minimum height of the new container, divide the total volume of the original container by the area of the base of the new container. Doing so results in $125.6 \div 16$, which is more than $7\frac{3}{4}$ but less than 8. We round up to the nearest $\frac{1}{4}$, so the minimum height of the new container is 8 inches.

8. **D:** The radius of the satellite's orbit is the sum of the Earth's radius plus the satellite's orbital altitude, or $r = 4{,}400$ miles. The circumference of the circular orbit is therefore $C = 2\pi r = 2(3.14)(4{,}400) = 27{,}632$ miles. Since 40 minutes is one-third of the satellite's 120-minute orbital time, it traverses one-third of this distance in that time. So, the distance is $\frac{1}{3}(27{,}632) \approx 9{,}210$ miles.