NAME KEY DATE PERIOD

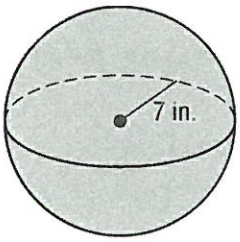
# Spheres & Spherical Geometry Practice Quiz

## Spheres

$SA = 4\pi r^2$

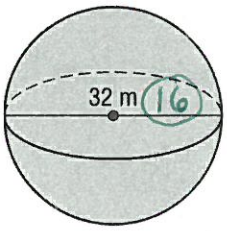
**Find the surface area of each sphere or hemisphere. Round to the nearest tenth.**

**1.**



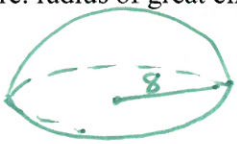

$SA = 4\pi r^2$
$= 4 \cdot \pi \cdot 7^2$
$= 4 \cdot \pi \cdot 49$
$\approx \boxed{615.8 \text{ in}^2}$

**2.**



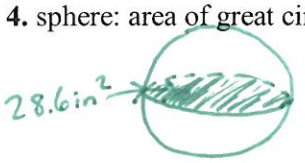

$SA = 4\pi r^2$
$= 4 \cdot \pi \cdot 16^2$
$= 4 \cdot \pi \cdot 256$
$\approx \boxed{3,217.0 \text{ m}^2}$

**3.** hemisphere: radius of great circle = 8 yd




$SA = \overbrace{\frac{1}{2}(4\pi r^2)}^{\frac{1}{2}\text{ sphere}} + \overbrace{\pi r^2}^{\text{base}} = 3\pi r^2$
$= 3 \cdot \pi \cdot 8^2$
$= 3 \cdot \pi \cdot 64 \approx \boxed{603.2 \text{ yd}^2}$

**4.** sphere: area of great circle $\approx 28.6 \text{ in}^2$

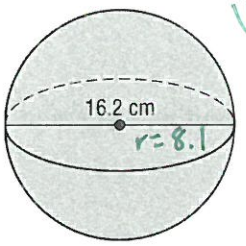



$A = \pi r^2 = 28.6$
$SA = 4(\pi r^2)$
$= 4 \cdot 28.6 = \boxed{114.4 \text{ in}^2}$

**Find the volume of each sphere or hemisphere. Round to the nearest tenth.**

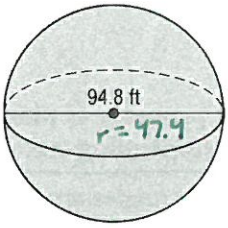
$V = \frac{4}{3}\pi r^3$

**5.**




$V = \frac{4}{3}\pi r^3$
$= \frac{4}{3} \cdot \pi \cdot (8.1)^3$
$= \frac{4}{3} \cdot \pi \cdot 531.441$
$\approx \boxed{2,226.1 \text{ cm}^3}$

**6.**




$V = \frac{4}{3}\pi r^3$
$= \frac{4}{3} \cdot \pi \cdot (47.4)^3$
$= \frac{4}{3} \cdot \pi \cdot 106{,}499.424$
$\approx \boxed{446{,}091.2 \text{ ft}^3}$

**7.** hemisphere: diameter of great circle = 48 yd

$\frac{2r}{2} = \frac{48}{2}$
$r = 24$

$V = \frac{4}{3}\pi r^3 \div 2$
$= \frac{4}{3} \cdot \pi \cdot (24)^3 \div 2$
$= \frac{4}{3} \cdot \pi \cdot 13824 \div 2 = \boxed{28{,}952.9 \text{ yd}^3}$

**8.** sphere: circumference of great circle $\approx$ 26 m

$\frac{2\pi r}{2} = \frac{26}{2}$
$\frac{\pi \cdot r}{\pi} = \frac{13}{\pi}$
$r \approx 4.138$

$V = \frac{4}{3}\pi r^3 = \frac{4}{3} \cdot \pi \cdot (4.138)^3 \approx \boxed{296.8 \text{ m}^3}$

**9.** sphere: diameter = 10 in.

$r = 5$

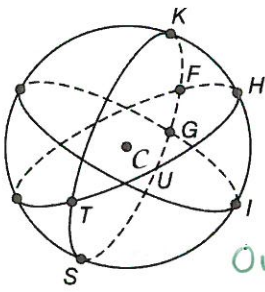
$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot (5)^3 = \frac{4}{3} \cdot \pi \cdot 125 \approx \boxed{523.6 \text{ in}^3}$

NAME _____ DATE _____ PERIOD _____

# Spherical Geometry

**Name two lines containing point *K*, a segment containing point *T*, and a triangle in each of the following spheres.**

**1.**

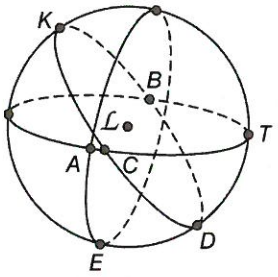



$\overleftrightarrow{SF}$ and $\overleftrightarrow{IH}$ contain point K.

$\overline{SK}$ contains point T.

One possibility:
$\triangle TKH$
(choose three non-collinear points)

**2.**



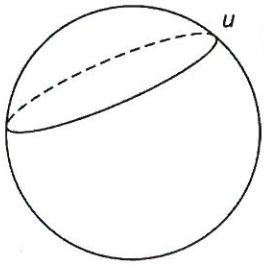

$\overleftrightarrow{CD}$ and $\overleftrightarrow{TE}$ contain point K.

$\overline{CB}$ contains point T.

One possibility:
$\triangle TDC$

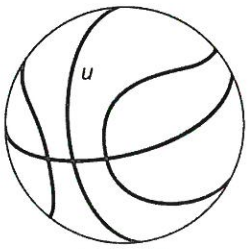
**Determine whether figure *u* on each of the spheres shown is a line in spherical geometry.**

**3.**




No - it is not a great circle (diameter is smaller than that of the sphere)

**4.**

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Yes - it is a great circle.

**Tell whether the following postulate or property of plane Euclidean geometry has a corresponding statement in spherical geometry. If so, write the corresponding statement. If not, explain your reasoning.**

**5.** If two lines form vertical angles, then the angles are equal in measure.

Yes.

**6.** If two lines meet a third line at the same angle, those lines are parallel.

No. There are no parallel lines in spherical geometry. On the globe, all the lines of longitude meet the equator at a right angle, but they're not parallel.

**7.** Two lines meet at two 90° angles or they meet at angles whose sum is 180°.

Yes.

**8.** Three non-parallel lines divide the plane into 7 separate parts.