Name: Solutions

8.6 Exam: Area, volume, solids, circles review

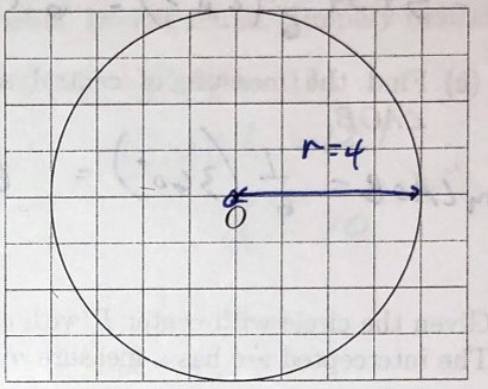
Unless otherwise instructed, find an exact answer, in terms of π or using radicals if necessary.

1. Use the formulas for the area and circumference of circles:

$$A = \pi r^2$$

$$C = \pi D = 2\pi r$$

2. Given the circle centered at O with radius $r = 4$. Leave an exact answer, in terms of π if necessary.



(a) Find the circumference of circle O.

$C = 2\pi 4 = 8\pi$

(b) Find the area of the circle.

$A = \pi 4^2 = 16\pi$

3. Find the radius of a circle having an area of 49π.

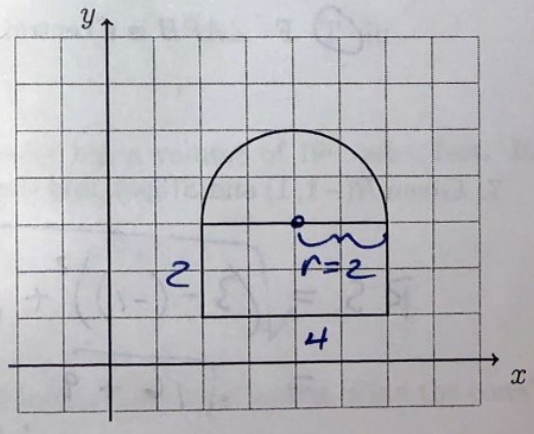
$A = \pi r^2 = 49\pi$

$r = 7$

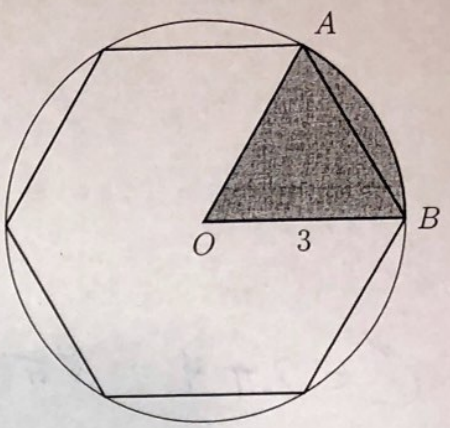
4. Find the area of the shape shown below composed of a rectangle and circular cap. Leave your answer as an exact value in terms of π.

$A = 2 \cdot 4 + \frac{1}{2}(\pi 2^2)$

$= 8 + 2\pi$



5. A regular hexagon (6 sides) is inscribed in circle O, having a radius $r = 3$.



(a) Find the area of the sector AOB.

$A_s = \frac{1}{6}\pi 3^2 = \frac{3}{2}\pi$

(b) Find the perimeter of sector AOB.

$P = 3 + 3 + \frac{1}{6}(2\pi 3) = 6 + \pi$

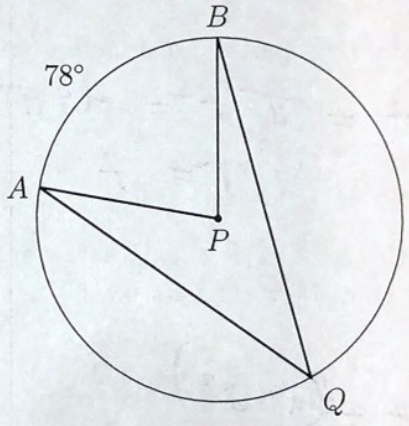
(c) Find the measure of central angle $\angle AOB$

$m\angle AOB = \frac{1}{6}(360^\circ) = 60^\circ$

6. Given the circle with center P with central angle $\angle APB$ and inscribed angle $\angle AQB$. The intercepted arc has a measure $m\widehat{AB} = 78^\circ$.

(a) Find $m\angle APB =$ 78°

(b) Find $m\angle AQB =$ $\frac{78}{2} = 39^\circ$



Circle True or False:

i (T) F $\overline{AP}$ is a radius

ii (T) F $\overline{AQ}$ is a chord

iii (T) F $\angle APB$ is a central angle

7. Given $R(-1, 1)$ and $S(3, 4)$, find the length of $\overline{RS}$. Note: $l = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

$RS = \sqrt{(3-(-1))^2 + (4-1)^2}$

$= \sqrt{16 + 9}$

$= 5$

8. Perform each calculation, writing down the full calculator display and then rounding to the *nearest hundredth*.

(a) $V = \frac{1}{3}\pi(2.7)^2(1.1)$

$= 8.39747...$

≈ 8.40

(b) $W = 5.1 + \frac{1}{2}\pi(7.1)$

$= 16.25265...$

≈ 16.25

9. Solve each equation for the appropriate variable. Do not round. Simplify radicals.

(a) $A = \pi r^2 = 18\pi$

$r^2 = 18$

$r = \sqrt{18}$

$= \sqrt{9}\sqrt{2}$

$= 3\sqrt{2}$

(b) $V = \frac{1}{4}(2.2)^2 h = 12.1$

$1.21h = 12.1$

$h = 10$

Model the situation with an equation. Use the formula sheet. You must start with a labeling variable. Do NOT solve!

10. A spherical cork fishing net float has a volume of 1700 cubic centimeters. Find its radius.

$V = \frac{4}{3}\pi r^3 = 1700$

11. A large concrete post in the shape of a cylinder has a volume of 190 cubic feet. Its height is 11 feet. Find the radius of the base of the post.

$V = \pi r^2 (11) = 190$

12. The volume of a cone having a **diameter** of 9 inches is 48 cubic inches. Find the cone's height.

$V = \frac{1}{3}\pi \left(\frac{9}{2}\right)^2 h = 48$

Applying density ratios

13. A tank of gasoline holds 17 gallons. Find the cost to completely fill the tank if gasoline costs \$4.35 per gallon.

$C = 17 \times 4.35$
$= \$73.95$

14. A tub of lard has a volume of 100 cubic centimeters. If the density of lard is 0.85 grams per cubic centimeter, find the weight of the tub of lard.

$W = 100 \times 0.85$
$= 85$ gms

15. A large glass marble has a diameter of 2.8 cm. The density of glass is 3.10 g/cm^3. Find the weight of the marble.

$V = \frac{4}{3}\pi\left(\frac{2.8}{2}\right)^3$
$= 11.49404\ldots$ cm^3

$W = 11.494\ldots \times 3.10$
$= 35.6315\ldots$
≈ 35.6 gms

16. A bar of solid gold is in the shape of a rectangular prism having a length of 18 cm, width of 8 cm, and thickness of 2.25 cm. The density of gold is 19.3 grams per cubic cm, and its approximate market value is \$55 per gram.

(a) Find the weight of the bar of gold.

$V = 18 \cdot 8 \cdot 2.25$
$= 324$ cm^3

$W = 324 \times 19.3$
$= 6253.2$ gms

(b) Find its value in dollars.

$\text{Value} = 6253.2 \times 55$
$= \$343,926$