

### Surface Area Task

A steel pipe in the shape of a right circular cylinder is used for drainage under a road. The length of the pipe is 12 feet, and its diameter is 36 inches. The pipe is open at both ends.

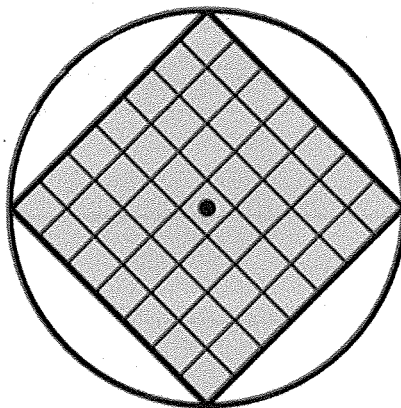
#### Part A

How many square feet of steel is the outer surface of the pipe? ?

Give your answer to the nearest integer.

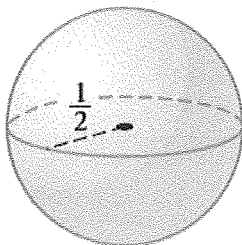
#### Part B

A wire screen in the shape of a square is attached at one end of the pipe to allow water to flow through but to keep animals from getting inside the pipe. The length of the diagonals of the screen are equal to the diameter of the pipe. The figure represents the placement of the screen at the end of the pipe.

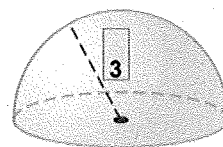


What are the perimeter and area of the screen?

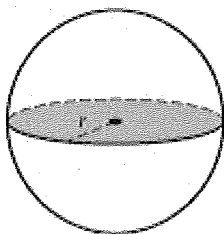
**#1: Find the surface area of the sphere.**



**#2: Find the surface area of the sphere.**



**#3: The shaded circle at right has area  $20\pi \text{ cm}^2$ . Find the surface area of the sphere.**

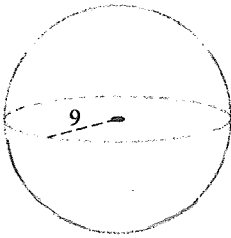


**#4: Find the surface area of a sphere whose volume is  $36\pi \text{ units}^3$ .**

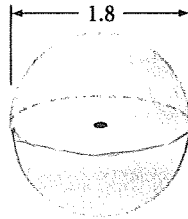
# EXERCISES

For Exercises 1–3, find the volume and total surface area of each solid.  
All measurements are in centimeters.

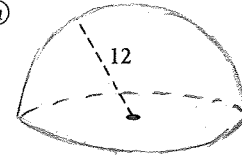
1.



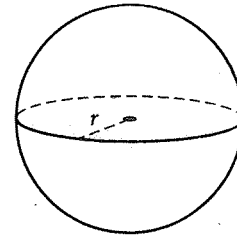
2.



3. (h)



4. The shaded circle at right has area  $40\pi \text{ cm}^2$ . Find the surface area of the sphere.
5. Find the volume of a sphere whose surface area is  $64\pi \text{ cm}^2$ .
6. Find the surface area of a sphere whose volume is  $288\pi \text{ cm}^3$ .

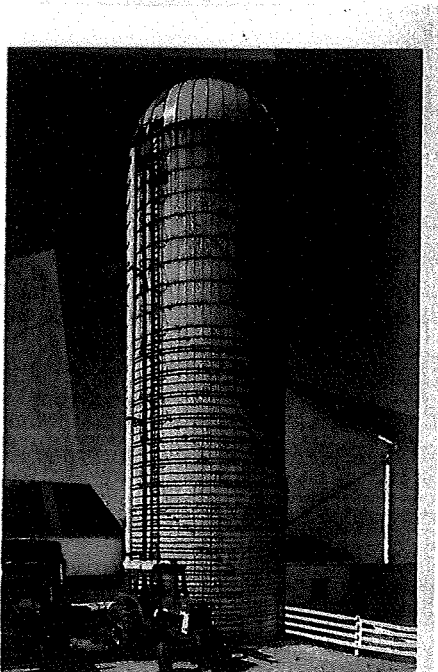
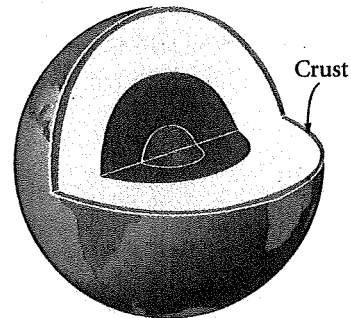


7. If the radius of the base of a hemisphere (which is bounded by a great circle) is  $r$ , what is the area of the great circle? What is the total surface area of the hemisphere, including the base? How do they compare?



8. If Jose used 4 gallons of wood sealant to cover the hemispherical ceiling of his vacation home, how many gallons of wood sealant are needed to cover the floor?

9. Earth has a thin outer layer called the *crust*, which averages about 24 km thick. Earth's diameter is about 12,750 km. What percentage of the volume of Earth is the crust?



**10. Application** A farmer must periodically resurface the interior (wall, floor, and ceiling) of his silo to protect it from the acid created by the silage. The height of the silo to the top of the hemispherical dome is 50 ft, and the diameter is 18 ft.

- a. What is the approximate surface area that needs to be treated?
- b. If 1 gallon of resurfacing compound covers about  $250 \text{ ft}^2$ , how many gallons are needed?
- c. There is 0.8 bushel per  $\text{ft}^3$ . Calculate the number of bushels of grain this silo will hold.

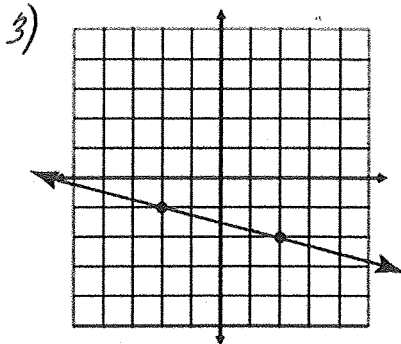
11. About 70% of Earth's surface is covered by water. If the diameter of Earth is about 12,750 km, find the area not covered by water to the nearest  $100,000 \text{ km}^2$ .

# End of Year Review Parallel and Perpendicular Lines

1) Describe the slope of parallel lines.

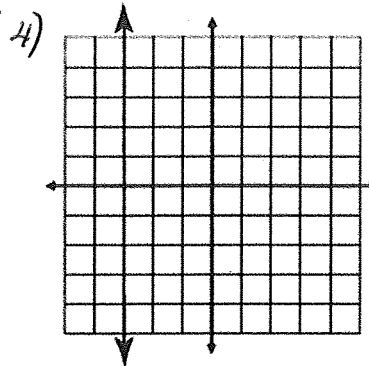
2) Describe the slope of perpendicular lines.

For questions 3-4 give the slopes of the lines that are  
parallel and perpendicular to the line on the graph.



Parallel Slope:

Perpendicular Slope:



Parallel Slope:

Perpendicular Slope:

## KNOW YOUR FORMULAS!

Slope Formula: \_\_\_\_\_ Slope-Intercept Form: \_\_\_\_\_

Standard Form: \_\_\_\_\_ Point-Slope Formula: \_\_\_\_\_

5) Which line is **parallel** to the line given below?

$$x - 3y = 24$$

A.  $y = 3x + 8$

B.  $y = -3x - 1$

C.  $y = \frac{1}{3}x + 3$

D.  $y = -\frac{1}{3}x - 4$

6) The line passing through which two ordered pairs would be **perpendicular** to the equation  $y = 4x - 1$ ?

A. (1, -3) and (2, 1)

B. (-4, 7) and (-1, -5)

C. (-8, -4) and (0, -2)

D. (4, 2) and (8, 1)

7) Which pair of lines are **perpendicular**?

A.  $x - y = 7$  and  $y = x + 3$

B.  $y = -4x + 1$  and  $8x + 2y = -10$

C.  $y = -8$  and  $y = 2$

D.  $x = 4$  and  $y = -1$

8) Write a linear equation that passes through the points  $(3, 1)$  and  $(-2, 6)$ .

9) Write an equation that is **parallel** to  $y = 3x + 5$  and passes through the point  $(-4, -13)$ .

10) Write an equation that is **perpendicular** to  $2x - 5y = 5$  and passes through the point  $(2, -9)$ .