51. **MULTI-STEP PROBLEM** A manufacturer is comparing two designs for a water tower: a sphere and a cylinder. Both designs have the same volume and the same radius.

a. Show that the height h of the cylindrical tank is $\frac{4}{3}r$.

b. Write an expression for the surface area of each tank in terms of r.

c. Find the ratio of the surface area of the spherical tank to the surface area of the cylindrical tank. *Explain* what the ratio tells you about which water tower would take less material to build.

52. **TAKS REASONING** The surface area S and the volume V of a cylindrical can are given by $S = 2\pi r^2 + 2\pi rh$ and $V = \pi r^2 h$ where r is the radius and h is the height.

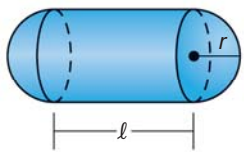
a. **Model** Write and simplify an expression for the efficiency ratio $\frac{S}{V}$.

b. **Calculate** Find the efficiency ratio for each can listed in the table.

	Soup can	Coffee can	Paint can
Height, *h*	10.2 cm	15.9 cm	19.4 cm
Radius, *r*	3.4 cm	7.8 cm	8.4 cm

c. **Compare** Rank the three cans in part (b) according to efficiency. *Explain* your ranking.

53. **CHALLENGE** A fuel storage container is shaped like a cylinder with a hemisphere on each end, as shown. The length of the cylinder is ℓ and the radius of each hemisphere is r. Show that the ratio of the surface area to the volume of the container is $\frac{6(2r + \ell)}{r(4r + 3\ell)}$.



MIXED REVIEW FOR TAKS

TAKS PRACTICE at classzone.com

REVIEW Lesson 1.2; TAKS Workbook

54. **TAKS PRACTICE** Which expression is equivalent to $3y[4 - (y + 2)] + 5y(y - 3)$? *TAKS Obj. 2*

Ⓐ $2y^2 - 9y$ Ⓑ $2y^2 - 3y$ Ⓒ $2y - 9$ Ⓓ $2y^2 - 6y + 15$

REVIEW TAKS Preparation p. 146; TAKS Workbook

55. **TAKS PRACTICE** Each year about 6800 freshmen attend the University of Texas. This is about 16% of the total enrollment. About how many students attend the University of Texas? *TAKS Obj. 9*

Ⓕ 17,700 Ⓖ 41,300 Ⓗ 42,500 Ⓙ 46,000

EXTRA PRACTICE for Lesson 8.4, p. 1017 ONLINE QUIZ at classzone.com