12. Kayden used the diameter of the sphere where she should have used the radius.

14. The two stacks have the same volume because they have the same height and equal cross sections at all heights.

15. Given $r = 2$. The two perpendicular great circles divide the sphere into four equal sections. The surface area of a section is one-fourth of the surface area of a whole sphere, $S.A. = \frac{1}{4} \cdot 4\pi(2)^2 = 4\pi$.

The volume of a section is one-fourth of the volume of a whole sphere, $V = \frac{1}{4}\left(\frac{4}{3}\right)\pi(2)^3 = \frac{8}{3}\pi$.

16. $A = \pi\left(r^2 - h^2\right)$

17. $A = \pi r^2$

18. $A = \pi\left(r\frac{h_1}{h+h_1}\right)^2$

19. 37.7 units^2

20. 4,536.5 units^2

21. 51.7 cm^2

22. 104.2 in^2

23. 9,202.8 units^3

24. 134.0 units^3

25. 3,619.1 ft^3

26. 65,449.8 m^3

27. 994.8 units^3

28. 4,817.1 units^3

29. 47 pumps

33. **I.** A

II. D

III. C

IV. B

34. (D) 4 ft.