Lesson 11.1.2

11-22. See below.

a. Typical response: all have lateral faces that meet at a point and three have a top vertex that lies above the center of the base while one does not. (Students will learn the term “oblique pyramid” in problem 11-35).

b. Pyramids B and C are square-based pyramids while pyramid D is a hexagonal-based pyramid.

c. B: \(SA \approx 36 + 4(19.8) \approx 115.2 \text{ cm}^2\); D: \(SA \approx 72 + 24 \sqrt{3} \approx 113.57 \text{ cm}^2\)

d. They are actually the same. Expect students to connect this with the fact that the area of a triangle remains constant as long as the base and height remain constant. Students will look at this more closely in Lesson 11.1.3.

11-23. The surface area is \(\approx 43,234\) square meters. This does not include the area of the base, which is 9,216 square meters. Therefore, \(\approx 173\) gallons of cleaning solution are needed.

11-24. The height of the pyramid must be perpendicular to the base and often lies inside the pyramid, while the slant height is perpendicular to a base edge and lies on the lateral face of the pyramid; we can use the Pythagorean Theorem to find one when given the other and the length of an edge.

11-25. 12 inches

11-26. a: \(\frac{1}{2}P_3 = 10,626\)  

b: \(\frac{1}{2}P_3 = 10,626\)  

c: \(1 \times 22 \times 22 = 484\)  

d: \(44 \times 22 \times 21 = 1848\)

11-27. The areas are all equal because the triangles have the same base and height.

11-28. a: \(x = 12.9\)  

b: \(x = 2\)  

c: \(x = 0\)  

c: \(x = \frac{23}{9} \approx 2.56\)
11-29. \( PA = PA \) (Reflexive Property), \( m\angle PBA = m\angle PCA = 90^\circ \) (tangents are \( \perp \) to radii drawn to the point of tangency), \( PB = PC \) (radii of a circle must be equal), so \( \triangle PAB \cong \triangle PAC \) (HL). Therefore \( AB = AC \) (\( \Delta s \rightarrow \) parts).

11-30. a: 10  
   b: \( \tan = \frac{8}{6}, \quad 53.13^\circ \)

11-31. \( \pm 6, 18, \pm 54 \)

11-32. D