**9-45.** If she needs the balloon to double in width, then the volume will increase by a factor of 8. That means the balloon requires 24 breaths to blow it up. Since she has already used 3 breaths, she needs 21 more to fill the balloon.

**9-46. See below.**

   a. $SA = 180\pi \approx 565.5$ in.$^2$; $V = 324\pi \approx 1017.9$ in.$^3$

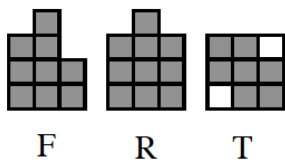   b. $324\pi \cdot 27 = 27{,}482.65$ in.$^3$

**9-47.** Circumference of each circle = $10\pi$; total distance = $20\pi \approx 62.8$ feet

**9-48. See below.**

   a. $x \approx 10.3$

   b. No solution because the hypotenuse must be the longest side of a right triangle.

   c. The length of the base of the composite triangle must be $6\sqrt{3}$. The smaller right triangle has a base length $6\sqrt{3} - 5 \approx 5.39$; $x \approx 8.07$.

**9-49. See below.**

   a. See diagram below.



        F    R    T

   b. V = 16 cubic units; SA = 52 square units

**9-50.** The line should be solid and the shading should be below the line.

**9-51.** See the area model below. A tree diagram would have worked as well. $\dfrac{3}{45} + \dfrac{4}{45} = \dfrac{7}{45} \approx$ 15.6%

|  | red oak $\frac{3}{9}$ | white oak $\frac{4}{9}$ | maple $\frac{2}{9}$ |
|---|---|---|---|
| granite $\frac{1}{5}$ | $\frac{3}{45}$ | $\frac{4}{45}$ | |
| tile $\frac{4}{5}$ | | | |

**9-52.** D