

Part IV: Readiness Test for Saxon's *Calculus*

The purpose of this section is to determine readiness for Saxon's *Calculus* textbook. Answering 10 or more problems correctly indicates readiness for Saxon's *Calculus* textbook. Answering 7 to 10 questions correctly indicates possible readiness for *Calculus*.

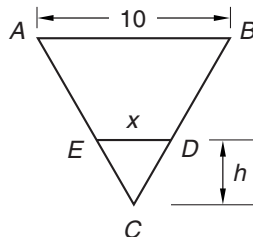
1. Given $f(x) = x^2$, find $f(x + h)$.
2. What are the exact values of (a) $\sin \frac{\pi}{6}$ and (b) $\cos \frac{\pi}{6}$?
3. Simplify:

$$\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$$

4. Graph the function

$$y = \sin\left(x - \frac{\pi}{4}\right)$$

5. Graph the set $\{x \in \mathbb{R} : |x - 3| < 4\}$ on a number line. Note that \mathbb{R} denotes the set of real numbers.
6. Graph the circle whose equation is given by $x^2 + y^2 + 6x - 6y + 2 = 0$. Indicate the coordinates of the center of the circle and the length of the radius of the circle.
7. Solve for x : $\log(1 + x) + \log(2 + x) = 2$
8. Triangle ABC is an equilateral triangle and segment ED is parallel to segment AB as shown in the figure below. Express x in terms of h .



9. Find all pairs (x, y) that simultaneously satisfy the following two equations:

$$x^2 + y^2 = 9$$

$$y - x = 1$$

Graph the two equations, and show the points of intersection of the graphs.

10. Prove the following trigonometric identity:

$$\frac{\cos^3(x) + \sin^3(x)}{\cos(x) + \sin(x)} = 1 - \sin(x) \cos(x)$$

11. Write an algebraic equation that expresses the following statement: the sum of the distance between point (x, y) and point $(1, 2)$ and the distance between point (x, y) and point $(3, 4)$ is equal to 10.

12. Given: $\overline{XZ} \cong \overline{YZ}$, $\overline{XV} \perp \overline{YZ}$, $\overline{YU} \perp \overline{XZ}$. Write a two-column proof to show that $\overline{XV} \cong \overline{YU}$.

